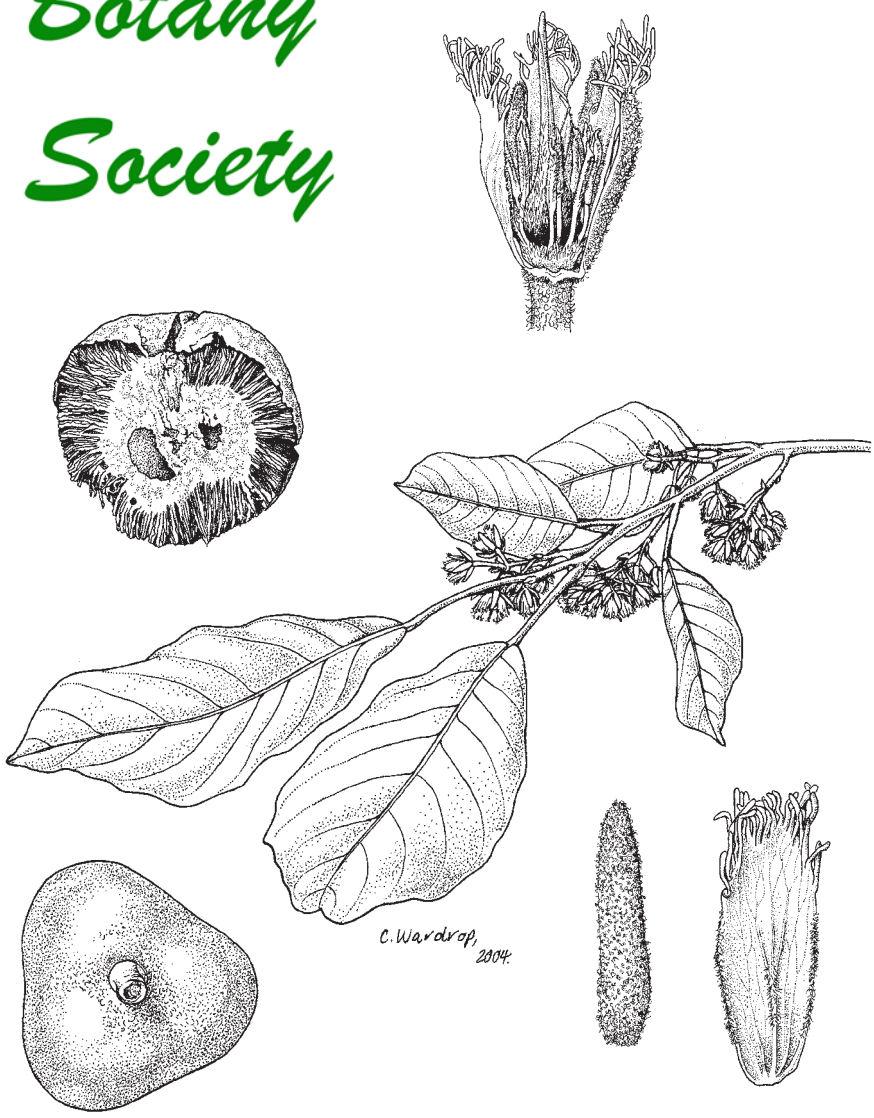
ASBS

Australasian Systematic Botany Society



Newsletter

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AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

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Sarah Mathews
Heidi Meudt
Joanne Birch
Katharina Schulte
Murray Henwood
Chair: Dan Murphy, Vice President

Grant application closing dates
Hansjörg Eichler Research Fund:
on March 14th and September 14th each year.
Australian Conservation Taxonomy Award:
in abeyance

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Grants Policy
Darren Crayn
Alexander Schmidt-Lebuhn
Jen Tate
Peter Weston
Peter Wilson
Chair: Mike Bayly (Council)

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ASBS Facebook Group

Viewable currently to any member of Facebook; permission to post by application to administrators.

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Todd McLay, email: tmclay@unimelb.edu.au
Mike Bayly, email: mbayly@unimelb.edu.au

Cover image: *Elaeocarpus sedentarius* Maynard & Crayn. Leafy twig with clockwise from top: open flower, petal, sepal, proximal end of fruit, longitudinally sectioned fruit. *Artist*: Catherine Wardrop (NSW). *With permission of* CSIRO Publishing.

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From the President

ASBS 2016 conference, Alice Springs

The 2016 ASBS Conference in Alice Springs is now but a memory of which Yelarney Beer and Charles Foster have written a great account (p. 31), so there is no need for me to go on at length. Suffice to say it was stimulating in so many ways, and even warmer, more personal and more communal than is usual for ASBS conferences. In this age of instant electronic communications in their myriad forms, there is no substitute for looking a friend or colleague in the eye, shaking their hand or patting their back and saying 'Great talk!', or 'Do you think we could start a project together...'. There will always be a place for the face-to-face. The whole show went smoothly: the organising committee, and especially the inimitable Jobbie, pulled off a performance for the ages. All who participated, as presenters or audience, are thanked for their contributions and are strongly encouraged to show up next year in Adelaide when Michelle and Ainsley reprise their organisational roles and Yelarney, Juergen and Molly bring their ideas into the team.

Conference Awards

The most enjoyable task reserved for the President is announcing awards and honours. This year the winner of the Pauline Ladiges award for best oral presentation by a student was Tim Collins (University of New England) for his talk "Would you like a new species and a fertile hybrid with that? *Eucalyptus magnificata* is not just an endangered species".

The Society also awards a prize for best poster by a student at an ASBS conference. This year the prize went to Charles Foster (University of Sydney) for "There goes *Thecanthes*: molecular systematics expands the circumscription of *Pimelea*"**.**

Both the Ladiges and poster prizes are generously sponsored by CSIRO publishing for which the Society, and indeed the winners, are grateful.

Lastly, the Bob Anderson award. In 2013 Rosemary Baxter, the sister of long-time ASBS member the late Dr Bob Anderson, provided a bequest of $2,000 to the Society in Bob's name. After discussion with the family, Council resolved to make an annual award to support registration fees of a student who attends the annual ASBS conference and presents a spoken or poster presentation. In consideration of Bob's institutional relationships, priority is given to a student from a developing country or, failing that, from South Australia or Victoria. This year the prize was awarded to Isaac Kerr from the University of Adelaide, who gave a great talk titled "A *Ripogonum* look-alike from the Oligocene of New Zealand: a lesson in the importance of cuticle."

All of the winners are warmly congratulated and encouraged to follow up their success with repeat performances at next year's conference in Adelaide.

Nancy T. Burbidge Medal

The Burbidge Medal is the highest honour the Society can confer. It is awarded to an individual who has made a long-standing and significant contribution to Australasian systematic botany. The Burbidge medallist for 2016 is Dr Tony Orchard. Elsewhere in this issue (p. 20) is a reproduction of the introduction to Tony and his career that I made at the conference, which outlines his extraordinary career and contribution to our science and our community. Congratulations Tony, well deserved.

Grants

Two awards were made in the September 2016 round of the Eichler research grants:

> Sophie Carter, University of Waikato. Project: *"Systematics of New Caledonian Cryptocaryeae Nees (Lauraceae)"*. Amount: $4690.
>
> Selen Mashayekhi, National Herbarium of NSW, Royal Botanic Gardens and Domain Trust. Project: "*Molecular systematics of the Australian genus* Corunastylis *Fitzg. (Prasophyllinae, Orchidaceae)"*. Amount: $5000.

Congratulations to both winners and the Society wishes you all success with your projects. Members will look forward to reading final reports in this Newsletter in due course.

Decadal Plan

Following a decision taken a few months ago,

and reported at the ASBS 2016 conference, the Decadal Plan group have approached the Ian Potter Foundation (IPF) for funds to complete development of the Plan. An initial meeting with the IPF indicated that broader engagement and endorsement of the project by stakeholder groups would increase the competitiveness of the bid. Specifically, we were asked to explain how the Plan would relate to the sectoral decadal planning process run by the Australian Academy of Science (AAS). We have been clear among ourselves that there is a profound need for a Decadal Plan for Systematics and Taxonomy. This needs to be separate from the plan for Ecology and Evolutionary Biology that the AAS has begun, under which systematics would otherwise be included (probably to our detriment, through dilution). Subsequently, our Plan was discussed with the Australian Academy of Science which has soundly endorsed a separate plan for systematics and the process we are running. This is great news as it strengthens our case for funding. Additional endorsements and letters of support will now be sought from other stakeholders including relevant scientific societies and peak bodies, and industry and other end-user groups.

eFlora of Australia

The eFlora of Australia project aims to produce an online Flora of Australia. It is the form in which the Flora of Australia series, which has ceased production of hard copy volumes, will be delivered in the future. Kevin Thiele gave a great outline of the scope and promise of the eFlora project at the Alice Springs conference. The platform has been developed and tested in partnership with the Atlas of Living Australia, and following a final coding 'sprint' (which will have taken place by the time you read this) will be deployed early in 2017 and available online for contributors to begin developing content. In the northeast we are already planning a few eFlora projects and I encourage others to as well. The Society contributes to this project directly through the ex officio role of the ASBS President on the eFlora of Australasia Advisory Group, which informs decision-making on the eFoA project.

Holiday season greetings

And finally on behalf of the Society I would like to take this opportunity to wish all members, their families and friends, a safe and enjoyable Christmas break. My personal thanks and best wishes are especially due the members of the ASBS Council - Dan Murphy (VP), Jen Tate (Secretary), John Clarkson (Treasurer), Ryonen Butcher and Matt Renner (Councillors) - as well as Public Officer Anna Monro for their efforts this year. I hope you all take time out over the break to refresh and recharge, and that you return in 2017 reinvigorated. This year has been a good one for the Society and for our discipline, and I look forward to next year being even better. Go well.

Darren Crayn

ASBS Inc. business

38th Annual General Meeting of the Australasian Systematic Botany Society Inc. – Minutes

Held at the ASBS annual conference in Alice Springs on 26th September 2016.

1. **Meeting opened** [4:35 pm]

2. **Apologies**: Mike Bayly, Leon Perrie, Rosemary Purdie, William Barker and Robyn Barker

3. **Confirmation of Agenda**: Confirmed as written – no other business

4. **Confirmation of previous minutes**: Moved Murray Fagg, seconded Peter Jobson

5. No **business arising**

6. **Correspondence**: No formal correspondence

7. No **business arising from correspondence**

8. **President's report**: Darren Crayn (DC) reported that the Society is in good shape – strong finances and growing membership. Annual meetings important – significant financial return from Canberra meeting – helps to offset cost of holding meetings in smaller and/or remote population centres, which are

important to maximise the Society's diversity and reach. The Newsletter continues to publish substantial amount of high quality content. The Facebook group has 648 members; society members number over 320. Strong need for continued and increasing support in systematics. Despite challenges, Australasian plant systematics continues to deliver world class science. For example, according to Kew's 'State of the World's Plants' report Australia is the #2 nation for number of new plant species described (after Brazil). Decadal plan is paramount to achieving necessary systematics/ taxonomy goals. DC thanked standing Council and welcomed incoming Council.

Moved: Juliet Wege and seconded: Gill Brown

9. **Treasurer's report**: John Clarkson (JC) tabled auditor's report. Currently 326 members (19 unfinancial). Late payments problematic but local conveners are helping to remedy. JC outlined the gender of membership and the distribution of assets in General Fund and Research Fund. Money from Marlies Eichler bequest has been transferred from the General Fund to the Research Fund. Eichler research grants are now worth up to $5000 each and new postdoc stipend of $10,000 for 2 years will be offered for the first in 2017. Developing an investment strategy for the Research Fund is a priority. Recommend no increase in membership fee.

Moved: Murray Fagg and seconded: John Hosking

DC thanked JC for all his hard work as treasurer and especially for his advice and historical knowledge.

10. **Webmaster report**: Murray Fagg reported on major activities on website. Three newsletters uploaded. Website migrated and now hosted by CSIRO due to staff changes. Updated listing of award recipients. Hits coming from outside home page – directed by Google search to an internal page. Newsletter 165 had most hits. Newsletter probably getting search hits from automatic academic search engines (from 11,550 hits per month in June 2012 to 41,536 in Feb 2016). JC pointed out that automated searches might not be a bad thing (increasing visibility). Dan Murphy (DM) indicated that Council email addresses are now gmail accounts – these are listed in newsletter.

11. **Newsletter report:** DC read out report prepared by Bill and Robyn Barker. Three issues of the ASBS Newsletter have been produced since the last AGM. While quality and volume of submitted content remains high, it is likely there is a lot of news relevant to the community that goes unreported. Members are encouraged to submit more material, and there is a role for chapter convenors in eliciting this. Publication of newsletters remains steadfastly behind schedule – something that needs to be improved. Printing and distribution of the Newsletter has become steadily more expensive, mostly tracking inflation, and remains a significant cost to the Society. Members are encouraged by Council to take the Newsletter electronically where possible. DC tabled report. DC thanked Bill and Robyn for their hard work on preparing the newsletter.

12. **Facebook report**: DC presented report prepared by Mike Bayly and Todd McLay, the keepers of the FB page. Now in its 4th year, 648 group members (up from 484 at last AGM). Postings every 1 or 2 days, spanning conference and job info, plant photos, queries for identification, etc.). Peter Jobson did good job advertising teasers for Alice Springs in lead up to conference. Postings are generally convivial. DC thanked Todd and Mike for maintaining and invigilating the group.

13. **Research Committee Report**: Dan Murphy (chair of committee) – tabled detailed report but delivered highlights. Generally five applications per round received for Eichler grants, which are now worth up to $5000. Alyssa Weinstein awarded Eichler in March. Minor changes to wording of Eichler rules (available on website) to clarify that students are eligible for multiple Eichlers as long as they are part of separate degree and project and reporting complete for previous Eichler grants. Some applicants not requesting the maximum $5000 perhaps due to belief that lower cost applications carry a competitive advantage. DM indicates this is a mistake – budget justification is most important, not the total ask. 2016 is the last year for ACT award – one in zoology and one in botany - since Nature Conservancy/Thomas Foundation funding not continuing. ACT award for botany

went to Charles Foster. Committee membership changed over last year, now comprises Joanne Birch, David Glenny, Murray Henwood, Sarah Mathews, Heidi Meudt, Katharina Schulte, Dan Murphy (as chair).

Report tabled and accepted.

DC thanked DM for doing great work with Research Committee.

14. **Grants Policy Standing Committee**: DC outlined history of the committee, which advises Council on ways to use Society funds to support its mission. Committee members include Mike Bayly (Chair), Peter Weston, Peter Wilson, Jennifer Tate, Gill Brown. Committee recommended to increase Eichler grants to $5000 maximum and this was implemented. Other recommendation was to initiate a postdoc scheme; this will be implemented in 2017. Advisory group identified gap for post-doc grants – essentially a top-up grant for fixed term positions (i.e., post docs). Recommended $10K per year for two years with one grant on offer each year. Cost to ASBS research fund is $20K per annum (after first year). DC outlined eligibility criteria as recommended by Committee (and endorsed by Council). Funding can be used for salary, research costs, small equipment (<$5K). Applications are scored according to applicant track record (40%), project merit and planning (40%) and value for money (additional benefits to the Society) (20%). Applications close on July 31, 2017 with funding available from Nov 2017. DC thanked Mike and the committee for recommendations.

15. **General Business**: none

16. **Student travel awards**. DC read out names of students awarded financial assistance to attend the Society's annual conference in Alice Springs.

17. **Council Officers**: DC thanked current council and especially thanked Mike and Leon who are stepping down from Council. Nominees for positions were elected unopposed – Council for 2016–2017 thus comprises Darren Crayn (President), Dan Murphy (Vice-President), John Clarkson (Treasurer), Jennifer Tate (Secretary), Matt Renner and Ryonen Butcher (Councillors). DC encouraged those considering nominating for the next Council to do so.

18. **Announcement of next meeting**: Meeting will be held in Adelaide as a conjoint meeting with SASB on the campus of the University of Adelaide. Tentative dates of November 26–29 2017, with AGM held that week. Organizing committee: Andy Austin (SASB), ASBS team: Michelle Waycott, Jurgen Kellerman, Molly Whalen, Yelarney Beer.

19. **Before closing**: DC announced Tony Orchard is the 2016 Burbidge Medal recipient.

20. **Meeting closed** 5:43 pm.

Attachment 1: President's report

At the end of the 2015/16 year, the ASBS remains in a strong position on any measure.

Finance: Balances in both the general and research accounts have grown. Having received an extremely generous bequest from the estate of the late Marlies Eichler, the Society formed a Financial Advisory Committee and a Grants Policy Committee to advise it on how best to use the Society's funds to support plant systematics research in Australasia. That committee has now provided considered advice which will be fully implemented over the next year. Small donations to the Research Fund by members together with interest earnings on the capital are sufficient to maintain a healthy balance. The 2015 Canberra conference turned a healthy profit of nearly $8400, a great result for the Society. The organisers are to be congratulated. Results like these offset the small losses that are expected for conferences in regional areas, which are important for the Society to maintain its reach and service to members in all areas.

Membership: From a low in 2011 member numbers have grown consistently to be over 320. While members come and go, it is heartening to see solid interest in the Society from students and early career researchers.

Communications: The Newsletter continues to publish high quality news items and articles. While more material is always welcome, the last few issues have been pretty thick

and content-rich. Profound thanks are due to Robyn and Bill Barker for coordination and production, John Clarkson for editing the book reviews, and Dan Murphy for soliciting reports from Eichler award recipients.

The ASBS Facebook group has grown consistently to now have 648 members (164 joining in the last year) including many non-members. Discussions are almost universally factual and convivial, and serve to promote the Society and keep members in touch with other enthusiasts. Mike Bayly and Todd McLay are thanked for invigilating posts and membership.

Australasian Plant Systematics – state of play

Despite the well documented decline in our workforce and recurrent funding, Australasian plant systematists continue to produce world class science. We are renowned for our outputs and our innovation – the acronym soup of virtual infrastructure we have built - AVH, ALA, APNI, APC, NZ eFlora, LucID, interactive keys (e.g. Wattle, Euclid, etc) - is the envy of the world. Kew's recent publication - the State of the World's Plants - notes that Australia is one of the top two source countries for plant species new to science, a place it has held since 1995. Nearly 200 new species of plants are discovered every year in Australia, ten percent of the world's annual total (based on a ten year average). We have the second highest rate of plant species discovery in the world, behind Brazil.

This finding highlights Australasia as not only one of those few special places on Earth that are hugely rich in biodiversity, but also one where there are still so many species left to discover. Every 2-3 years we add 1% to the total of known Australian plant species, and the rate shows no signs of slowing down."

A reversal of the recent trend of declining investment in systematics is critical, as part of a broader reinvigoration of STEM, so that Australia's biodiversity knowledge continues to improve. The Decadal Plan is an attempt to address this.

eFlora of Australia project

The eFlora of Australia project aims to produce an online Flora of Australia. It is the form in which the Flora of Australia series which has ceased production of hard copy volumes, will be delivered in the future. The eFlora platform has been developed and tested in partnership with the Atlas of Living Australia, and is nearly ready for deployment. The Society contributes to this project directly through the ex officio role of the ASBS President on the eFlora of Australasia Advisory Group, which informs decision-making on the eFoA project.

Decadal Plan

Significant progress on the Decadal Plan for Australasian Systematics has been made on several fronts including engaging the zoological and microbial systematics communities and working with the ABRS to survey the systematics community to estimate current status and trends. Consultation on the principal goals of the Decadal Plan will be undertaken at this conference during the session on the second day. Despite these gains, progress has not proceeded at the rate we would like, and it has become clear that completion of this project will require significant funds to engage a writer for several months - the Society has pledged $5000 toward this. To secure the additional funds required the ASBS has participated in the development of a funding pitch for philanthropic sources and will help deliver this at a high level meeting with the CEO of the Potter Foundation on October 10 2016.

This report completes the first year of my Presidency, which I have thoroughly enjoyed and hope was at least somewhat effective. I thank my colleagues on Council (Dan Murphy, John Clarkson, Leon Perrie, Jen Tate and Mike Bayly) and welcome Dan, John, and Jen who are re-elected unopposed as Vice President, Treasurer and Secretary respectively, and especially welcome new Councillors Ryonen Butcher and Matt Renner.

In closing, despite the assaults that successive governments at State and Federal levels have visited upon the Australasian plant systematics community (and our losses have been keenly felt by all, directly or indirectly), we remain resilient, and highly productive, therefore I remain optimistic for the future. We have a lot to celebrate as a Society and a community of scholars, colleagues and friends, and a great deal to look forward to. Bring on 2016-17!

Darren Crayn

Attachment 2: Treasurer's report

Presented at the Society's Annual General Meeting in Alice Springs 26th September 2016

1. Introduction

I am pleased to present the financial statements of the Australasian Systematic Botany Society (ASBS) for the year ended 30 June 2016. The finances of the Society are run on a financial year basis with data reported on a full cash basis. The change to a full cash system for accounting has made preparation of this year's financial statement much easier. It is recommended that this system be retained in the future.

Brian Woods of DFK Kidsons audited the accounts for the fifth consecutive year. His report to members is attached as Appendix 1.

2. Membership

Table 1 records the number of members of ASBS at the end of September 2016 and this is reproduced graphically in Figure 1. Late payment of subscriptions is a chronic problem although this year is slightly better than last year when 26 members remained unfinancial at the AGM and that meeting was held 2 months later. Unpaid fees total $675 compared to $830 by the AGM last year.

This year I enlisted the help of local conveners to contact members who had failed to pay their subscriptions and I thank them for their efforts. Members are reminded that annual subscriptions fall due in January.

Membership numbers have remained reasonably stable for the past 4 years (Fig. 2) with the number of members leaving the society for various reasons being roughly balanced by new members, mostly students. The Society has an interesting gender balance. While males represent 59% of the total membership, female student members outnumber males 53:47%.

Twenty people were admitted to the Society since membership figures were reported at the last Annual General Meeting (see list below). 42% of these are students.

The following new members are welcomed to the Society:

Margaret Baker, WINMALEE, NSW
Yelarney Beer, ADELAIDE, SA
Margaret Brookes, MALVERN EAST, VIC
Jessica Bruce, YAKINE, WA
Hugh Burley, PADDINGTON, NSW
Joel Callaghan, BALGOWLAN, NSW
Sophie Carter, HAMILTON, NZ
Gintaras Kantvilas, SANDY BAY, TAS
Patricia Lu-Irving, TUCSON, USA
Keith McDonald, ATHERTON, QLD
Shirley McLaren, ARMIDALE, NSW
Francis Ng, CANNING VALE, WA
Andy Nilsen, DUNEDIN, NZ
Jasper John Obico, CHRISTCHURCH, NZ
Caroline Pannell, OXFORD, UK
Hilary, Pearl MALENY, QLD
Brietta Pike, CLAYTON SOUTH, VIC
Megan Rixon, WILLIAMSTOWN, VIC
Rismita Sari, TRINITY PARK, QLD
Kor-jent van Dijk, ADELAIDE, SA

3. Management of Funds

The Society's funds continue to be managed in two clearly defined sets of accounts – the General Fund and the Research Fund. This is important because the Society is registered with the Australian Taxation Office (ATO) as a Deductible Gift Recipient. Donations to the Research Fund are tax deductible in Australia. The ATO imposes various restrictions on how funds that attract tax deductions can be used. By managing two sets of accounts, funds subject to these restrictions can be clearly identified.

Since it was received in 2014, the Marlies Eichler bequest has been held in the General

Table 1. Membership of ASBS as of 26th September 2016 (non-financial members in brackets)

Fee	Full	Concessional	Gratis	Total
Ordinary	180 (10)	n/a	0	**180 (10)**
Student	n/a	58 (7)	0	**58 (7)**
Retiree	n/a	57 (2)	0	**57 (2)**
Unemployed	n/a	9 (0)	0	**9 (0)**
Institutional	5(0)	n/a	14	**19 (0)**
Life	n/a	n/a	3	**3**
Total	**185 (10)**	**124 (9)**	**17**	**326 (19)**

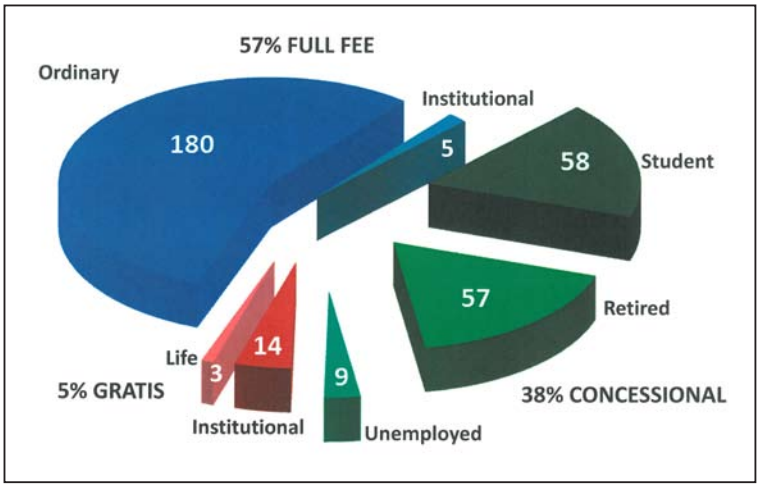

Fig. 1. Membership classes

Fund pending a Council decision on how the funds should be used. This has now been resolved and the $562,800 has been transferred to the Research Fund.

4. General Fund

Assets in the General Fund are held as cash at call. A small amount required for day to day needs is held in a cheque account with the Commonwealth Bank and the balance in a high interest earning account with RaboDirect.

4.1 General Fund Income

Income to the General Fund comes from two primary sources – subscriptions and interest earned. Investment income this year has been artificially inflated by the income from the Marlies Eicher bequest. Income from this source totalled $27,456. This was added to the term deposit and transferred to the Research Fund at the end of the financial year. The actual investment income from General Funds was $2,637.

To assist the organising committee, financial transactions associated with the Alice Springs conference are being processed through the General Fund. By the end of the financial year $4,655 in registrations had been received.

The income from the Nature Conservancy represents 2 progress payments. A further $13,000 is payable next financial year on submission of the final report.

As is usual, donations to the Research Fund are banked in the General Fund and transferred to the Research Fund just prior to the end of the financial year.

4.2 General Fund Expenditure

There was no unusual expenditure for the financial year. The Australian Conservation Taxonomy (ACT) Award is cost neutral because grants are matched by funds received from the Nature Conservancy.

Conference support includes financial support to students who attended and presented a poster or oral presentation at the Canberra conference. This conference returned a profit of $8,360 but this was received too late to appear in the 2015/16 financial statement.

Newsletter costs include printing ($2,875) and postage ($978) for 4 issues. The number of members opting to receive the Newsletter as hard copy is gradually decreasing. As the

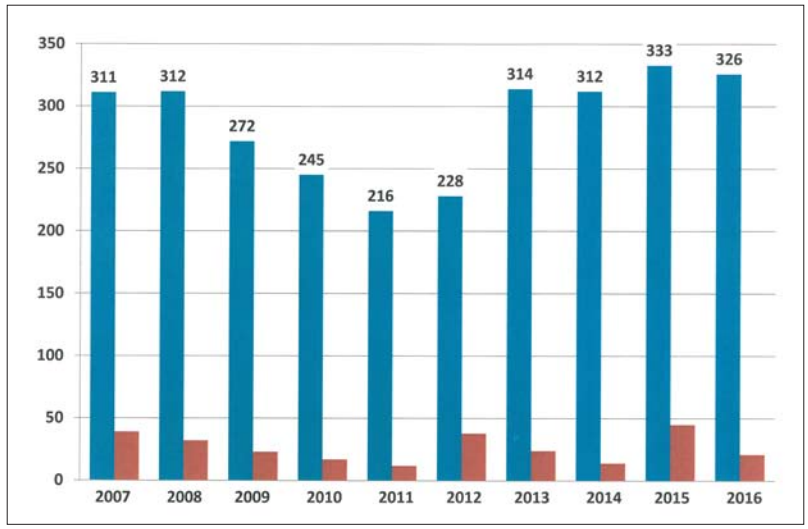

Fig. 2. Membership trends in the past 10 years. Labelled bars are total membership. Shorter bars are new members.

print run declines, the unit cost of producing the printed version will increase however Council has no intention to cease production of the printed version. Members are encouraged to consider switching to the electronic version. This is available a week or so before the printed version and is produced in colour.

4.3 Current Assets in the General Fund

Transferring the Marlies Eichler bequest to the Research Fund has resulted in an apparent loss of $57,029 in the General Fund. This is a one-off anomaly. It will show as income in the Research Fund and have no effect on the Society's total overall financial position. Removing this anomaly indicates a General Fund surplus for the financial year of $45,771.

At the end of June 2015 the Society held assets of $143,209 in the General Fund. This is an $18,104 improvement in the position of a similarly adjusted figure for the 2014/15 financial report and largely reflects the late arrival of the funds for the ACT Grant. Grants were paid in the 2014/15 financial year before the funds were received from the Nature Conservancy.

5. The Hansjörg Eichler Research Fund

Income in the Research Fund is derived from donations from members, income from funds invested and bequests. Grants made to students are the only expenditure.

Fifty four members made donations to the Hansjörg Eichler Research Fund totalling $2,720. All donors, including the following members who agreed to having their names recorded publicly, are acknowledged for their generous support (Table 2).

Table 2. Donors to the Hansjörg Eichler Research Fund.

Helen Aston	Pauline Ladiges
Margaret Beal	Bruce Maslin
Graham Bell	Merran Matthews
Chris Betteridge	Dirk McNicoll
Barbara Briggs	Peter Michael
Carrick Chambers	Sofie Pearson
John Clarkson	Rosemary Purdie
Trevor Clifford	Chris Quinn
Darren Crayn	Matt Renner
Mike Crisp	Carolyn Sandercoe
Rogier de Kok	Elizabeth Sheedy
Abdul Ghafoor	Kelly Shepherd
Laurie Haegi	Jennifer Tate
Caroline Haskard	John Thomson
Frank Hemmings	Stephen van Leeuwen
Megan Hirst	Helen Vonow
Gareth Holmes	Juliet Wege
John Hosking	Judy West
Laurie Jessup	Peter Weston
Richard Jobson	Annabel Wheeler
Greg Jordan	Karen Wilson
Nunzio Knerr	Peter Wilson

A number of members have advised Council that they have nominated the Society as a beneficiary in their wills. Council thanks them for that while wishing them a long and happy life. A gift from your estate is a simple and effective way of making lasting provision for the people and causes you care about. If you include a gift for the Society in your will, please consider notifying the Secretary. Your personal information will be held in strictest confidence, and your anonymity maintained if you wish.

The transfer of the Marlies Eichler bequest from the General Fund has artificially inflated the surplus. As was done with the General Fund, removing this on-off anomaly reveals a surplus for the year of $8,377. This is half of the figure of $17,395 reported for the 2014-15 financial year. This is partly due to the lower interest rates currently available on term deposits and partly to when term deposits mature and are reported in the financial statement. The current term deposits will mature in October 2016 and January 2017.

Council has ratified a new grants program. This has increased Eichler Grants from a maximum of $2,000 to $5,000 and introduced a new post-doc stipend of $10,000 per year for 2 years. When fully operational this will amount to a total annual expenditure of $40,000.

The total current assets in the Research Fund total $1,116,631. 28.9% of this is in managed funds, 70.5% in term deposits and 0.7% at call in a cheque account (Fig. 3). In the current financial climate this is rather too much money to hold as cash. The Treasurer is working with the financial advisory standing committee to prepare an investment strategy for Council's consideration. It is hoped this will be finalised early in the coming year once the term deposits mature.

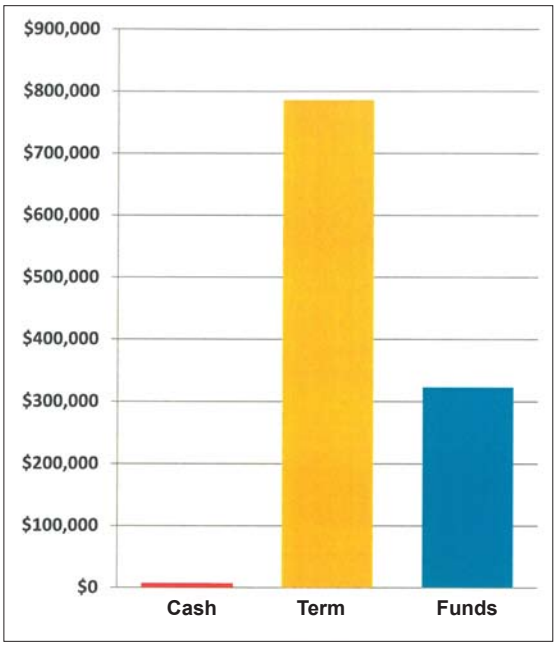

Fig. 3. Total assets in the Research Fund amount to $1,116,631. These are spilt: 28.9% in managed funds, 70.5% in term deposits and 0.7% at call in a cheque account.

The Society thanks the ongoing assistance of the financial advisory standing committee Patrick Brownsey, David Cantrill, Bruce Evans and Bob Hill in helping develop an investment strategy that can deliver sufficient income to fund these needs, hedge the funds against inflation and ensure a small growth in capital

6. Summary

The Society remains in a very strong financial position. With expenditure from the General Fund being matched by income, no significant expenditure foreshadowed and ample cash reserves in hand, it should not be necessary to increase the subscription fee for the 2016 membership year.

A challenge facing Council in the coming financial year will be to turn its attention to the $143,209 surplus in the General Fund to see how this might be used to promote the study of plant systematics

John Clarkson
Treasurer
October 2016

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED
(An incorporated association)
FINANCIAL REPORT
FOR THE YEAR ENDED 30 JUNE 2016

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

COUNCIL MEMBERS' REPORT

Your Council members submit the financial statement of the Australasian Systematic Botany Society Incorporated for the year ended 30 June 2016.

Council Members

The names of the Council members who held office throughout the reporting period and at the date of this report are:

President	Darren Crayn	Elected November 2015
President	William (Bill) Barker	Stood down November 2015
Vice President	Daniel Murphy	Elected November 2015
Vice President	Michael Bayly	Stood down November 2015
Secretary	Leon Perrie	Elected November 2014
Treasurer	John Clarkson	Elected December 2013
Councillor	Michael Bayly	Elected November 2015
Councillor	Jennifer Tate	Elected November 2015
Councillor	Kelly Shepherd	Stood down November 2015
Councillor	Daniel Murphy	Stood down November 2015

Principal Activities

The principal activities of the association during the reporting period were to promote systematic botany in Australasia.

Significant Changes

No significant change in the nature of these activities occurred during the reporting period.

Operating Results

The operating results are as set out hereunder:

	Year ended June 2016	Year ended June 2015
	$	$
Research Fund	571,177	17,395
General Fund	(517,029)	30,279
Total	54,148	47,674

Signed in accordance with a resolution of the members of the Council.

Darren Crayn (President) John Clarkson (Treasurer)
26th September 2016

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

INCOME STATEMENT

FOR THE YEAR ENDED 30 JUNE 2016

	Note	2016	2015
		$	$
RESEARCH FUND			
Income			
Donations to Research Fund		2,720	3,025
Transfer of Marlies Eichler Bequest from General Fund	4	562,800	-
Investment Income	2	20,359	21,720
Total Income		585,879	24,745
Expenditure			
Research Grants		14,672	7,350
Bank Charges		30	
Total Expenditure		14,702	7,350
Surplus	3,5	571,177	17,395
GENERAL FUND			
Income			
Advertising in Newsletter		250	-
Conference		4,655	-
Australian Conservation Taxonomy Award		26,000	-
Investment Income	2	30,093	10,919
Subscriptions to ASBS Inc.		11,580	10,125
Donations to Eichler Fund		2,720	3,035
Bequests		-	31,265
Sundry income		-	10
Total Income		75,298	55,354
Expenditure			
Australian Conservation Taxonomy Award		16,250	8,979
Auditor's remuneration		1,980	1,980
Bank fees, Credit card charge facility		350	338
Conference expenses including Student Grants		3,559	7,965
Newsletter expenses (printing, postage)		2,853	2,039
Registrar General returns		39	38
ASBS Council Travel (AGM, Special GM)		632	711
Miscellaneous expenses (e.g. postage)		1,144	-
Transfer donations to Research Fund		2,720	3,025
Transfer of Marlies Eichler Bequest to Research Fund	4	562,800	-
Total Expenditure		592,327	25,075
Surplus	3,5	(517,029)	30,279

The accompanying notes form part of these financial statements.

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

BALANCE SHEET
AS AT 30 JUNE 2016

	Note	2016	2015
		$	$
ASSETS			
Current Assets			
RESEARCH FUND			
Cash at Bank		7,265	11,983
Investments			
Colonial Managed Investment		104,304	101,285
Commonwealth Term Deposit		223,897	220,000
Australian Bond & Growth Funds		218,365	212,186
Marlies Eichler Bequest		562,800	-
Total Current Assets Research Fund	3	1,116,631	545,454
GENERAL FUND			
Cheque Account		26,339	10,864
Savings Account		116,870	114,241
Term Deposit (Bequests)		-	535,133
Total Current Assets General Fund	3	143,209	660,238
Total Current Assets		1,259,840	1,205,692
NET ASSETS		1,259,840	1,205,692
MEMBERS' FUNDS			
Accumulated surplus – opening		1,205,692	1,158,018
Surplus for the period		54,148	47,674
Total Members' Funds		1,259,840	1,205,692

The accompanying notes form part of these financial statements.

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

NOTES TO AND FORMING PART OF THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 30 JUNE 2016

Note 1: Statement of Significant Accounting Policies

The financial report is a special purpose financial report prepared in order to satisfy the financial reporting requirements of the members. The Council has determined that the Society is not a reporting entity.

The financial report has been prepared in accordance with the requirements of Australian Accounting Standard AASB 1031: Materiality. No other applicable Accounting Standards, Australian Accounting Interpretations or other authoritative pronouncements of the Australian Accounting Standards Board have been applied.

The financial report has been prepared on a cash basis.

The following specific accounting policies, which are consistent with the previous period unless otherwise stated, have been adopted in the preparation of this financial report.

(a) Membership

Membership is recorded on a cash basis.

(b) Income Tax

Under present legislation the Society is exempt from income tax and accordingly no provision has been made in the accounts.

(c) Comparative Figures

Where required by Accounting Standards comparative figures have been adjusted to conform with

the changes in presentation for the current year.

Members Funds

In accordance with the rules of the Society accumulated funds are not available for distribution to its members.

Note 2: Investment Income

	2016	2015
	$	$
RESEARCH FUND		
Interest Received		
Cheque Account	3	4
Distributions		
Term Deposit	11,157	1,645
Colonial First State (Diversified Fund)	3,019	7,490
Australian Bond and Growth Fund	6,179	12,581
Total Investment Income	20,359	21,720
GENERAL FUND		
Interest Received		
Cheque Account	8	7
Savings Account	2,629	3,137
Term Deposit (Marlies Eichler Bequest)	27,456	7,775
Total Investment Income	30,093	10,919

Note 3: Accumulated Funds

RESEARCH FUND		
Accumulated Surplus – Opening	545,454	528,060
Surplus for the period	571,177	17,395
Accumulated Surplus – Closing	1,116,631	545,454
GENERAL FUND		
Accumulated Surplus – Opening	660,238	629,958
Surplus for the period	(517,029)	30,279
Accumulated Surplus – Closing	143,209	660,238
Total Surplus for the period	54,148	47,674
Total Accumulated Surplus	1,259,840	1,205,692

Note 4: Marlies Eichler Bequest

At its meeting on the 29th November 2015, Council resolved to transfer funds in the Marlies Eichler bequest from the General Fund to the Research Fund when the term deposit matured on 23rd June 2016.

Note 5: Adjusted Surpluses

The Marlies Eichler bequest brought to account in the year ended 30 June 2014, has been transferred from the General Fund to the Research Fund. The table below presents the operating results had the funds not been transferred.

	Year ended June 2016	Year ended June 2015
	$	$
Research Fund	8,377	17,395
General Fund	45,771	30,279
Total	54,148	47,674

Research Committee

The Australasian Systematic Botany Society is an approved research institute.

The approved membership of the Research Committee comprises:

Daniel Murphy (Chair)	
Greg Leach	Appointed August 2009
Philip Garnock-Jones	Appointed July 2011
David Glenny	Appointed March 2013
Sarah Mathews	Appointed March 2015

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

STATEMENT BY THE MEMBERS OF THE COUNCIL

The Council has determined that the Society is not a reporting entity and that this special purpose financial report should be prepared in accordance with the accounting policies outlined in Note 1 to the financial statements.

In the opinion of the Council:

The financial report as set out on pages 1 to 6 presents a true and fair view of the Society's financial position as at 30 June 2016 and its performance for the year ended on that date.

At the date of this statement, there are reasonable grounds to believe that the Society will be able to pay its debts as and when they fall due.

This statement is made in accordance with the resolution of the Council and is signed for and on behalf of the Council by:

President ……..

Darren Crayn – President

Treasurer ……..

John Clarkson – Treasurer

Dated this 26th day of SEPTEMBER 2016

dfkkidsons
LEADING ACCOUNTANTS AND BUSINESS ADVISERS

DIRECTOR
Brian Woods FCPA

19 September 2016

AUST0001/4/BW/tm

The Council
Australasian Systematic Botany Society Incorporated

Attention: Mr John Clarkson (Treasurer)

Dear Sir,

Independent Auditor's Report to the members of the Australasian Systematic Botany Society Incorporated

We have pleasure in presenting this report to the members of the council in respect of our audit of the financial report of the Australasian Systematic Botany Society Incorporated for the year ended 30 June 2016. This should be lodged with your Annual Return to the Office of Regulatory Services.

Auditors are encouraged to report to management on less material issues in a separate management letter; our report to management is enclosed.

Please find our invoice is attached for your attention.

Should you have any queries regarding the enclosed, please do not hesitate to contact me.

Yours faithfully,

DFK Kidsons

BWoods

Brian Woods
Director

We make it happen!

DFK INTERNATIONAL A member firm of DFK International a worldwide association of independent accounting firms and business advisers

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Appendix 1.
Auditor's Report

Attachment 3: ASBS Website Report: 1 July 2015–30 June 2016

The Society's website continues to be maintained by Murray Fagg and Anna Monro. Previously physically hosted on servers at the Australian National Botanic Gardens (ANBG), the site was migrated in April 2016 to be hosted on a server at CSIRO, along with the majority of the Gardens' web presence. This migration should be invisible to users, as it will not result in any changes to the look and feel of the sites or to the manner in which content is updated. However, the change of the ASBS web presence to a distinct domain (*www.asbs.org.au*) in 2014 and the further change in the hosting this year have caused some difficulties in gathering and interpreting statistics for the Society's site. Any numbers given in this report should thus be viewed with caution.

Other than the hosting of the Canberra 2015 conference information as a subsite under the ASBS domain, the year's web activities were largely "business as usual". Four issues of the *ASBS Newsletter* were uploaded (162/163, 164, 165, 166) and various ongoing updates were made to listings of job and training opportunities and award recipients.

In the past, web statistics have been reported for June each year in an attempt to provide comparable numbers. However, statistics have not been provided in the website reports printed in the ASBS Newsletter since June 2012. While we were able to glean some overall figures for the 2015/16 year, the system used for logging web statistics on the ANBG servers is not directly comparable to that used by CSIRO. As a result, February 2016 has been used as the "benchmark" in this report, as it was the last month that seemingly reliable statistics could be taken from the ANBG servers.

Overall traffic to the website has increased markedly since 2012, although it is not clear exactly how much of this is the result of non-human "visitors" (e.g. search engine web crawlers). There was an average of 1,432 hits per day in February 2016 (cf. 385 hits per day in June 2012). In February 2016 the ASBS home page received 1,867 hits (i.e. 64 hits per day, down somewhat on the 2,971 hits in June 2012 that equated to 104 hits per day). The PDF for *ASBS Newsletter* issue #165 (December 2015, reporting on the Canberra 2015 conference) actually received far more hits than the home page, with a total of 10,324 hits (cf. 1,273 hits for issue #150 in June 2012). It is difficult to believe that the downloads of a single newsletter could have increased eight-fold even given a four-year gap in statistics, and it would seem most logical to attribute this to automated "crawling" visits. It's certainly markedly easier to find PDF newsletter content via a Google search than it once was.

In summary, the traffic to the website remains fairly stable or has slightly increased in some areas. There is still some work to be done to calibrate the web statistics now that the site is hosted by CSIRO and it should be noted that we are likely to be only able to provide partial statistics in the 2016/17 report.

Anna Monro

Attachment 4: Newsletter report

Since the last AGM, in the 10 months that have passed, three issues of the Newsletter have been produced on-line and in print. All have suffered from the now embedded delays in the calendar months set down for publication; we just don't seem to be able to get out of this rut. However, we do endeavour to keep Council and contributors who contact us up to speed with the projected real deadline.

We are grateful to the many members who have contributed, but still think that there is a lot of news which is not being reported. It would be great if more of our chapter conveners took a leaf out of the Western Australian book.

We are especially grateful to those writing articles. We had a wonderful Burbidge Medal tribute to a still productive Jack Elix; we received four Eichler reports, a requisite for those receiving grants from the Society; and due to John Clarkson's diligence we have published 11 book reviews, the longest of them a magnum opus from Alex George on the Bauers. It is unfortunate that in a relatively short time we have had tributes for 12 systematists and others supporting our work who have passed away, but at the same time the effort that has gone

into some of the larger tributes has been highly informative and will no doubt be of use for those seeking information in the future.

Many thanks to Anna Monro and Murray Fagg for their time in loading each issue on the web. We know it does not always come at a convenient time.

Costs

Australia Post charges have increased considerably in recent times. This has been further exacerbated by two of the three issues this year falling over the 125 grams (60 odd internal pages). Our bill for postage for below and above 125 grams has increased by about $65 to $80 per issue (36%) above 2014 rates

The cost to the Society of the smallest (issue 159 in 2014) with 36 pages was $563.23 compared with $814.96 for the largest (issue 165) this year of 72 pages.

However, the cost of printing and the cost of postage do balance out on a per page cost. Costs of printing seem to have kept at the same level as in 2014 and because our issues in the last year have been on the large to very large, per page costs of printing are 20-30% less than for smaller issues.

So the unit total cost/page of our smallest was 14 cents, compared with that of the largest this year of 72 pages (issue 165) being 10 cents!

Next issue

We are keen to have a bumper September issue[1] by including the conference articles. As seems the norm, we are not ready to commence putting this issue together on schedule and not until the end of the month. We gather reporters have already been engaged and we'd request that we get copy within a week or two of the conference end. We do have a fine draft of a personal tribute to Ian Brooker from Steve Hopper. We call on any further tributes, articles, book reviews (via our faithful co-editor John Clarkson), news (please – there is plenty we and members are unaware of), Eichler and ACT reports, meeting and exhibition reports, etc.

Robyn and Bill Barker

[1] We subsequently agreed to Council's offer to combine the September and December issues in deference to Robyn's illness and offering a chance to get back on schedule with the Newsletters. *Eds*

Attachment 5: Facebook group report

In its fourth year of life, the ASBS Facebook group has continued to grow, from 484 members at the time of the last AGM to 648 members in September 2016. This includes a large proportion of people who are not financial members of ASBS but are, presumably, interested in what we do.

Because of the way the group is configured in Facebook (as a "group" rather than a "page"), we can't easily derive statistics on the number of posts, "comments", "shares", "likes", etc. without manually trawling through them. However, from a quick count, it is safe to say that there are regular posts to the group at least every 1-2 days on average, with over 220 posts in the nine months between the 2015 and 2016 AGMs. Posts cover a variety of topics including news article relating to plants/environment/science in general, paper or book announcements, jobs and funding opportunities, herbarium news, death notices or obituaries, photos of plants, and ASBS business, including announcements relating to conferences, newsletters, membership payments, etc.

A relatively small percentage of group members actively post content (notably Phil Garnock-Jones, Leon Perrie, Chrissen Gemmill, Mike Bayly, Jim Croft, Todd McLay, Jen Tate, Heidi Meudt, David Cantrill, Alex Chapman, Peter Wilson, Ailsa Holland, Adrienne Markey, Andrew Thornhill, Tim Entwisle), but quite a few members make occasional posts and there is a very good level of engagement in terms of members "liking" or responding to posts with comments. Peter Jobson did a sterling job of promoting the charms of Alice Springs ahead of this year's conference, with daily posts in the final weeks.

The ASBS group is currently "public", which means anyone can see the group, members and posts, but only people in the group can post to the page. Requests to join are vetted by Mike Bayly or Todd McLay.

Discussions of the group are overwhelmingly convivial, in line with the good nature of our

botanical community, making administration of the group very straightforward. We had one incident this year where an ant plant enthusiast was stroppy at us, as a community, about the quality of some data in Australia's Virtual Herbarium, but the fuss was short-lived and the author promptly left the group after giving us a piece of his mind. One of his posts was deleted by the administrators because it included detailed locality information for a species of conservation concern, and we were keen to observe the usual standards about dissemination of such information in the public domain. Thankfully such incidents, and difficult characters, are few and far between.

This Facebook group is a great way for the dispersed members of our society to keep in touch and discuss our common interests. If you are on Facebook and haven't yet joined our group, you should!

Todd McLay and Mike Bayly

Attachment 6: Research grants report

Eichler research grants

There were two rounds of Eichler research grants since the last Annual General meeting, closing in March and September 2016. This year, after the Grants Policy Standing Committee's recommendation, the maximum amount per Eichler research grant was increased from $2000 to $5000. Five applications were received in each round (this was also the case last year, so submissions are stable). One grant was awarded in the March round, to a value of $4672. The Award was made to:

> Alyssa Weinstein, The Australian National University. Project: "Cryptic speciation within the genus *Drakaea*: can combining genetic analyses, floral chemistry, and pollination data provide taxonomic resolution?"

At the time of the 2016 AGM, the September round has just gone to assessment by the Research Committee.

Australian Conservation Taxonomy Award

The Australian Conservation Award aims to support student research in systematics that contributes to biological conservation. It is supported by The Nature Conservancy (TNC) and the Thomas Foundation. This year was the final round of a three year agreement and final reporting requirments for ASBS on the scheme have now been completed. While ASBS council was keen to explore continuing the award via a new agreement with TNC, the award's support via the Thomas Foundation to TNC was concluded in 2016. Therefore, the ACT award scheme will not be continued unless a new donor emerges, and this is not likely to occur in the short-term.

For the May 2016 round of the ACT award, there were eight Zoological applications. These were assessed by representatives of the Society of Australian Systematic Biologists and James Fitzsimons from The Nature Conservancy. The award of $5000 was made to:

> Danielle Stringer, The University of Adelaide, "Investigating the evolution and systematics of endemic *Haloniscus* isopods (Oniscidea: Scyphacidae) from arid zone groundwater-dependent ecosystems using next generation sequencing techniques"

In the Botanical category, one application was received. The ASBS Research Committee in conjunction with James Fitzsimons from The Nature Conservancy assessed the application and found it to be of an excellent quality and funded the project of:

> Charles Foster, The University of Sydney, "Using high-throughput sequencing to resolve the complicated evolutionary history of rice flowers (*Pimelea*: Thymelaeaceae)"

Charles was awarded $5000 towards the research proposal, and will be reimbursed up to $2000 to attend and present talks at the next two ASBS conference. Charles is presenting a talk in Alice Springs.

The two recipients of the 2015 Botanical awards - James Clugston, RBG Sydney (enrolled at the University of Edinburgh) and Rachael Fowler, The University of Melbourne and RBG Victoria - will both present talks at the 2016 ASBS conference in Alice Springs. James has returned to the UK for his studies, so

will be presenting a pre-recorded talk.

From the botanical perspective, the ASBS council felt there was clear need for an award such as the ACT award, and while the Botany applications were lower and more erratic in number (9) than the Zoology applications (20), it was noted that the quality of the applications was consistently high. Upon discussion with members of the ASBS council, it was thought the relatively low numbers of applicants may reflect the current decline in universities training a new generation of botanical systematists, and the nature of the erratic timing of enrolments in a smaller cohort of students (rather than a lack of interest). We believe this situation demonstrates the great need for the ACT award or similar, as it clearly indicates to potential students and university researchers that funding in support of systematics and taxonomy is available. As such, the ACT award has been a great asset to the systematics community because we see there is student demand that is being unmet by the current university system in Australia, at least in part due to the lack of suitable supervisors and difficulty in accessing research funding.

The Society of Australian Systematic Biologists (SASB) plans to launch a PhD research award in 2017 and to a large degree it has been the success of the ACT research grant that has accelerated their decision on this.

From the botanical perspective, the ASBS council support the creation of a similar award for New Zealand participants, and future discussions with New Zealand representatives of TNC and ASBS about how this might occur are recommended. The ASBS council supported and lobbied for the inclusion of New Zealand participants in the ACT awards; however, this was simply outside the remit of the Thomas Foundation's funding rules. There may be potential for future discussions with the newly established New Zealand program of TNC.

Hansjörg Eichler Research Committee

This year we recruited four new members of the Research Committee and farewelled Greg Leach in January 2016. We thank all past and continuing members of the Research Committee for the time-consuming and careful job they do in assessing applications for the ASBS Research Funds.

The current Hansjörg Eichler Research Committee is:

Dan Murphy (Chair, *ex officio* as ASBS Vice President), Royal Botanic Gardens Victoria

Joanne Birch, University of Melbourne, Australia

David Glenny, Landcare Research Manaaki Whenua, Lincoln, New Zealand

Murray Henwood, University of Sydney, Australia

Sarah Mathews, Centre for Australian National Biodiversity Research, Canberra, Australia

Heidi Meudt, Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand

Katharina Schulte, Australian Tropical Herbarium, Cairns

Dan Murphy, Vice-President ASBS,
ex officio Chair of Research Committee

Attachment 7: Grants Policy Standing Committee report

The Grants Policy Standing Committee has this year included Mike Bayly (chair), Peter Weston, Peter Wilson, Jen Tate, Alexander Schmidt-Lebuhn and Gillian Brown, a new member this year, replacing Darren Crayn.

The main task of the committee this year was to develop recommendations for implementing a new postdoctoral support scheme, based on principles discussed at the last ASBS council meeting and AGM. This postdoctoral grant scheme is intended to support research in systematic botany and the career development of recent PhD graduates, by providing top-up funds to researchers already successful in attracting other postdoctoral support. Such top-ups are considered useful because many

postdoctoral schemes are not fully funded, in terms of either salary or research costs, and this can limit the research and career opportunities of early career systematists. Providing strategic support to already successful early career systematists aims to facilitate quality research in systematics and also help recent graduates to capitalise on postdoctoral opportunities and improve their competitiveness for more permanent positions.

The new recommendations of the committee, outlined here as tabled at the ASBS council meeting and AGM in Alice Springs, addressed the aims, scope, timing, eligibility and assessment criteria for the grants. The recommendations align with the previous proposal as discussed by Council and at the Canberra (2015) AGM. Some key points, and reasons for the recommendations, are as follows.

Recommendations on eligibility criteria for postdoctoral scheme

These grants should be for research projects focused on the systematics of plants, algae or fungi. This could include studies of taxonomy, phylogeny and/or biogeography.

Grants should be open to applicants who meet the following criteria:

1. Are members of the Australasian Systematic Botany Society.
2. Hold a PhD relevant to systematics of plants, algae or fungi that was completed within the last 10 years. At a minimum, a PhD must be completed (letter of acceptance by university) by the commencement of grant funding. Exceptions on the 10-year limit should be considered for applicants with career interruptions associated with family commitments or other extenuating circumstances.
3. Hold a short-term post-doctoral position at an Australasian research institution. Generally, this should include post-doctoral fellowships obtained on a competitive basis from funding agencies (e.g., Australian Biological Resources Study, Australian Research Council, Marsden Fund), or through internal institutional schemes (e.g., university post-doctoral fellowship grants). Other post-doctoral positions could be considered, but applicants with ongoing salaried positions should not be eligible for these grants.

Rationale for recommendations eligibility

These criteria are intended to target grants at early career researchers who do not hold ongoing positions, i.e., helping them to bridge the gap between PhD studies and secure employment. We have suggested that these grants should not be available to those who already hold ongoing positions; even though such people might be early career researchers and could usefully use the money, we see merit in helping to support those still in postdoc limbo and seeking to transition into ongoing jobs. The committee was keen to give some flexibility in the definitions of what sorts of post-doc schemes these grants might complement and on what the time limit since PhD should be. This includes consideration of applicants more than 10 years post PhD where there are extenuating circumstances, as well as considering applicants on the cusp of PhD completion at the time of grant submission that anticipate being fully completed before grant funding would commence (in line with common practices of other grant schemes). The assessment process will inherently favour those applicants already holding grants through other competitive post-doc schemes, but the suggested wording on eligibility does not necessarily preclude those holding other sorts of short-term positions (or no position at all) from applying.

Recommendations on size and duration of postdoc grants

Grants should be for up to $20,000 (AUD) over two years. Funds could be spent on salary for the applicant or project costs (including consumables, essential minor equipment <$5,000, travel associated with fieldwork, contracted services such as DNA sequencing, technical assistance).

Rationale for recommendations on grant size and duration

The level of grant funding aligns with expected income on investments in the Research Fund,

as discussed in our last committee report. The recommendations on use of funds are intended to give recipients some flexibility. Funding for salary of the applicant or for project costs aligns with the goals of the grant; allowing expenditure on small equipment might be more debatable, but there are situations where that could be strategic.

Recommendations on timing of postdoc grant rounds

The first round of grants could commence from 2017, and three rounds could be comfortably planned in the short term (opening 2017, 2018 and 2019), based on funding currently available. The intention should be for these grants to continue in the longer term, with regular review by ASBS Council and the Grants Policy Standing Committee regarding size of grants, their financial sustainability, and the benefits they bring to plant systematics and the support of early career researchers. Grant applications in each round could close on July 31. Funding for successful applicants could commence from Nov 1, after the completion of necessary agreements.

Rationale for recommendations on timing

Given that funding for most postdoc schemes starts either early- or mid-calendar year, if we want to maximise the chances of offering two years of funding (assuming most will be on three year grants), then a date soon after mid-year would be a good time to take applications. The proposed application date and commencement of the "activity period" of grants would require a quick turn-around on grant assessments, but that should be possible. If institutions are delayed in approving paperwork, etc., then the start date could push backward. This timing also means that the Research Committee will receive applications at a time when they are not also considering other grants (i.e., between the March and September Eichler rounds).

Recommendations on assessment criteria for postdoc grants

Applications should be judged on: research track record of the applicant, relative to opportunity; merit of the research project; and value for money, which includes the value of the grant in supporting the activities of the recipient, and the nature of additional research the grant will facilitate.

The committee has provided a draft scoresheet to ASBS Council to consider for use by the ASBS Research Committee when assessing applications. However, members of the Grants Policy Standing Committee are keen to emphasise that numerical scores should just be part of the ranking process and not the ultimate arbiter of funding outcomes. We encourage the chair of the Research Committee (usually Vice President, ex officio) to consider the strengths/weaknesses of the various rankings by committee members and to attempt to gain a consensus of views among the Research Committee before making recommendations to Council. Apart from scores, we recommend that the assessment sheet specifically asks committee members to indicate whether or not they consider an application fundable, and to give clear reasons as to why they might not support any particular application. This is in line with practices currently used in assessing Eichler grants and will give committee members the chance to identify any applications they see as fundamentally flawed.

Rationale for recommendations on assessment criteria

The assessment criteria align with the aims of supporting promising early career systematists and well-founded projects with a good chance of making a useful contribution to plant systematics.

Recommendations on grant conditions

The committee provided ASBS council with a draft set of standard "grant conditions" that the host institutions of successful applicants should accept to initiate payment. These concern the details of how financial payments will be made, the grant duration, use of grant funds, progress and financial reporting, etc. Given the size of these new grants (a sizeable outlay by ASBS), it seemed useful for the society to have a formal document outlining such conditions.

Mike Bayly (Chair)

The Nancy Burbidge Medal

Dr Anthony E. Orchard, Burbidge Medallist 2016

Darren Crayn
President, ASBS

Tony's botanical career began at the University of Adelaide, where he completed Honours for work on the genus *Acaena* and a PhD under Hansjörg Eichler for taxonomic studies in the Halogoraceae. He moved swiftly into a Botanist position at the SA Herbarium in 1972, and swiftly again into the role of Curator of the Cheeseman Herbarium in Auckland NZ which he held for six years. From there he took up the Curatorship of the Tasmanian Herbarium, where among his many achievements over the 14 years he held this role, was recognition of the importance of the cryptogam collection and modernisation of its curation, and the beginning of the process of digitisation that prepared HO for its role in the AVH.

In 1992, Tony moved to Canberra to begin his extraordinary contribution to the *Flora of Australia* project, initially as one of the editors, and later as Alex George's worthy successor as Chief Editor. There is no doubt that his understanding of nomenclature, the Code, and methods in taxonomy, based not only on formal training but also on extensive personal research experience, contributed to the *Flora* and other ABRS publications being not only extremely useful but also scientifically precise and nomenclaturally accurate. Compliance with the rules of nomenclature is sometimes taken for granted, and sadly not all Floras measure up to the standard Tony set for Australia's.

Tony's taxonomic output has been prodigious as both author and editor. He has over 150 publications in taxonomy including numerous flora treatments and full revisions of many and varied plant groups but mainly Asteraceae and Halogoraceae. Never shy of expressing a considered argument, he has been a potent contributor to a number of key debates in taxonomy including *Acacia* nomenclature, the recognition of paraphyletic taxa and the merger of the zoological and botanical Codes. He has been an important chronicler of the history of Australasian systematic botany, in particular the *Flora of Australia* project and more recently the life and works of Alan Cunningham. As Editor he directed the publication of 20 volumes of the *Flora of Australia* and 10 parts of the *Species Plantarum* series, as well as a number of interactive identification products and other miscellaneous publications of the ABRS.

A personal reflection on Tony's influence is provide by Gintaras Kantvilas:

> We all decry the demise or reduction of formal training in taxonomy, and I personally feel acutely the loss of capacity in Australia of that knowledge and experience. Tony is that active link to the formal

Fig. Tony Orchard presenting his lecture under the watch of Darren Crayn. Ph. M. Waycott

European taxonomic tradition that was brought to Australia and promoted through generations of students by Hans-Jörg Eichler. On countless occasions I have had cause to check something with Tony, whether it be a curly typification, or a tricky synonymy or whatever. He is remarkable in that he always has an answer, even if the matter needs some lengthy consideration. Tony is renowned for his knack of posing the pertinent (and impertinent) question. I shudder to think of how some of these complex taxonomic problems will be unscrambled when left solely to us, "young, next generation" botanists working solely from logic, limited experience and delving through the Code."

Never one to rest on his laurels, Tony continues his contributions to our science in his retirement.

I am sure you will all agree with Council that Tony Orchard is a worthy recipient of the Nancy Burbidge medal for 2016.

Burbidge Medal talk

Allan Cunningham: botanist, explorer, ecologist, geographer (and zoologist, geologist, plant geographer, anthropologist, agricultural consultant, linguist, and social commentator)

A.E. (Tony) Orchard
Canberra

I was privileged, many years ago, to meet Nancy Burbidge. There were several other notable women in her cohort of botanists of the early and middle 20th century: Con Eardley in Adelaide, Winifred Curtis in Hobart, Mary Tindale in Sydney, Lucy Moore in Christchurch, to name just four. All had a number of shared characteristics. They were all formidable women. They had to be, to forge professional careers in a male-dominated world. All were also fanatically devoted to their science, and as a result left a lasting valuable legacy for us. It is a great honour for me to accept this medal named for Nancy Burbidge, and I hope that my legacy may in some small way complement that of Nancy Burbidge and her contemporaries.

I want to talk to you today about another formidable botanist who left a major legacy: Allan Cunningham.

This talk is all Bob Makinson's fault. When I was about to head off to London as ABLO in 2008, he suggested I might look into some of the Cunningham papers held there. His motivation was to try to tease out additional information on the original localities for some rare *Grevillea* species, and to complete work begun many years ago by Elsie Webster to publish Cunningham's journals in full. Eight years, several papers (Orchard 2013, 2014, Orchard & Orchard 2013), and three books (Orchard & Orchard 2014, 2015a, 2015b) later my wife and I are still working our way through a mass of letters, journals, specimen records and publications, and calculate that there are at least three more books and several more papers (e.g. Orchard 2017, submitted) involved before we reach the end of what was supposed to be a relatively trivial task. Thanks Bob.

Allan Cunningham: botanist

I don't need to spend much time on telling this audience of Allan Cunningham's importance as a botanist. He was sent to Australia by Sir Joseph Banks and William T. Aiton to collect seeds, bulbs and living plants to augment the collections of the then King's Garden at Kew. In this he was very successful, to the extent that a whole glasshouse was eventually devoted to his introductions, as well as other plantings. He was responsible for the introduction of hundreds of of Australian and New Zealand species to cultivation in London. The voucher specimens he was instructed to collect, however, provided his lasting legacy. These ended up principally in the Natural History Museum and Kew Herbarium in London, but duplicates have been widely distributed and can now be found in at least 30 herbaria worldwide.

On his way to Australia, Cunningham called first at Rio de Janeiro, where he and his fellow collector, James Bowie spent two years, collecting around Rio and undertaking a major overland expedition to São Paulo.

Cunningham arrived in Australia in December 1816, and was immediately attached to Oxley's first inland expedition, tracing the courses of the newly discovered Lachlan and Macquarie Rivers. When he returned to Sydney, he found a letter from Banks, instructing him to join Phillip Parker King on a surveying expedition to northern Australia in the *Mermaid* to continue the work begun some 12 years earlier by Flinders and Brown. This expedition subsequently became four voyages to NE, N, NW and SW Australia between 1817 and 1822, with side trips to Timor (twice), Tasmania and Mauritius.

When King was recalled to London in 1822 to publish his charts, Cunningham began a series of inland expeditions which eventually extended over most of the western slopes of New South Wales, and the Moreton Bay region of present day Queensland. He visited New Zealand twice as well as Norfolk Island. His living plant collections and seeds amounted to several thousand, as did his herbarium specimens. It is the latter that have provided his lasting legacy. Cunningham himself only had a limited window of opportunity to publish his work, during a 5 year return to England in 1831–35, but in that period he published a *Flora of New Zealand*, 47 collaborative papers with William Hooker in *Curtis's Botanical Magazine*, and 4 papers in *Edward's Botanical Register*. These papers included revisions of *Alyxia*, *Tristania* and *Calytrix*, as well as a lengthy description of the New Zealand flax industry. He also prepared a Flora of Norfolk Island, but publication of this was forestalled by the appearance of Endlicher's *Prodromus Flora Norfolkicae* in 1832. His papers contain hundreds of systematically arranged descriptions of plants that he had collected, and it appears he had had plans to, perhaps, collaborate with Robert Brown on completing the latter's *Prodromus*. However his real botanical contribution is in his collections which have become the basis for description of hundreds of Australian plants. His herbarium certainly far exceeds 5000 specimens, and there are over 450 names in APNI for which the authorship is "A.Cunn. ex…". Other botanists, including Bentham, both Hookers, Candolle, Don, Meisner, Endlicher Fenzl, Robert Brown and many others used his specimens either as types or supporting material in their descriptions.

Fig. Allan Cunningham in about 1835.
Lithograph by A.Picken, published by Day & Haghe.

Allan Cunningham: explorer

Cunningham was sent to Australia primarily as a collector of propagation material of Australian plants for Kew, a task he carried out to the great satisfaction of Banks and Aiton, sending home thousands of packets of seeds, bulbs and living plants in earth. With King he visited localities spread around over half of Australia's coastline. In many cases he was the first botanist to visit these areas. His first inland expedition in 1817 with Oxley was at the behest of Governor Macquarie. His later expeditions were however more problematical. Banks had expected that Australian Governors would support Cunningham in his search for new plants, but they were reluctant to expend scarce colonial resources on a task from which they derived little benefit. Macquarie eventually provided minimal support, but other Governors were more reluctant.

Cunningham countered this by pointing out the benefits to agricultural development that would be derived from his exploration. There was a rapidly increasing population and all suitable land east of the ranges was soon taken up. Cunningham proposed to successive Governors that in exchange for their support of horses, carts, people and rations, he could in the course of his botanical explorations, map suitable agricultural land on the western slopes of New South Wales, starting at Bathurst and progressively moving northwards. This he did, discovering among other things, Pandora's Pass into the southern side of the Liverpool Plains, the Darling Downs, and the critical access to the latter, Cunningham's Gap. He explored the course of the Brisbane River, proving that it originated on the eastern side of the range, not in the swamps of the Macquarie River as some had supposed. Cunningham received nothing from the colonial governments for his discoveries, despite others making much small erdiscoveries receiving generous land grants or financial rewards.

These major expeditions resulted in Cunningham writing a series of detailed reports for the colonial government. These reports ate into his time, but the activity provided valuable logistical support for his activities in the face of increasing parsimony from the British Government. And Cunningham did not view it as a chore. As time went on he began to enjoy the exploratory aspects of his expeditions as much as the botanical ones, and he derived a genuine pleasure in expanding knowledge of agricultural land. He had learned basic surveying techniques from Oxley, King and others, and produced detailed maps of his trips. He also included in his journals numerous sketches of topography.

While Cunningham obviously became more and more interested in geographical exploration, he never neglected his primary purpose of plant collecting. Indeed on several occasions he commented, on finding good pastural land, that it was boring botanically, being uniform and species poor, while the best botany was to be had on the rocky barren hills and plains.

Allan Cunningham: ecologist

It is stretching the point a little to talk of Cunningham the ecologist when the science as such barely existed in the 1820s. However it is true to say that he had a keen appreciation of the way plants related to their environment. With a gardener's eye he provided Aiton at Kew with detailed descriptions of the habitat in which plants were found, their soils, exposure, requirements of humidity or heat etc. While not unusual by present day standards, these ecological notes were most unusual for their day, when most herbarium specimens were labelled only with the country of origin. Some examples are:

> 41. Rhexia (gibbosa) [possibly *Tibouchina heteromalla*] fine sp. on the Armazem [Corcovado] 4 Jan. in light vegetable earth, fully exposed to the scorching sun on the highest peak of the Mountn, its succulent leaves enabling it to brave the heat, these specimens tiresome in drying, easily losing their leaves. Cunningham
>
> Plant list of 10 February 1816, RBG Kew, Archives, Kew Collectors KGL/5/1, ff 59-65

> Kew Gardens will shine in Melastoma, Malpighia, Banisteria, Bignoniaceae, Gardeniae and many other new & interesting genera. The Melastomae will not succeed unless plunged into strong heat, peat earth, kept shaded & very moist.
>
> Letter Allan to Richard Cunningham 7 February 1816, RBG Kew, Archives, Kew Collectors KCL/5/1, ff. 174, 175

> 162. Laurinae. Tetranthera ferruginea Br. (Banks & Solander). A slender Tree in shaded Thickets, in vicinity of Water Gully, Percy Isles No. 1, 4 June.
>
> Plant list, Mermaid 2nd voyage, Cunningham Papers Vol. 2, Natural History Museum, London, ff. 5/1, 1–37

In letters to his friend Charles Telfair in Mauritius he speculated on the growing conditions that governed distribution of mosses and ferns. In these private letters he was free to indulge in speculation and theorising, as opposed to the strictly utilitarian tone of his official letters to Banks, Aiton and others:

> (Discussing the NW coast) I attribute the absence of the Cryptogamia to the Geological structure of the entire line of Coast and the nonexistence of primary mountains (as on the Eastern or opposite coast) where

> these plants abound on land above an ordinary Elevation – to the absence of lofty dense forests and the consequent general exposure to the Sun of those arid shores so much to the injury of the Filices which in all countries are found to exist in profusion in permanently moistured atmosphere and in situations abundantly sheltered.
>
> Cunningham, letter to Telfair of mid-1824, from Sydney).
>
> The prevailing Character of the face of our Colony, you may have heard, is either a dry open Forest-land, an arid sandstone Shrubby tract, or a reedy Swamp. It is therefore no small treat to the Botanist to return from these scenes to the dark shades of a Tropical Forest, where an even & permanent degree of humidity is maintained, where in consequence of the density of the vegetation, the shade of Cabbage Palms, cryptogamous plants flourish in every stage of Luxuriance from the smallest *Hypnum* or moss to the large, the stately, the majestic Tree fern, *Alsophila australis*.
>
> Cunningham, letter to Telfair of 1 August 1824, from Illawarra).

Allan Cunningham: physical geographer

To mount his inland expeditions Cunningham was reliant on the goodwill of successive NSW Governors. He needed them to provide horses, tents and other equipment, provisions, sometimes a cart, and convict servants. To persuade them to provide these expensive commodities Cunningham stressed the survey aspects of his expeditions. He became a competent surveyor and produced workmanlike maps. He produced sketches of topography which are scattered throughout his journals. His reports to the NSW Government are copious, and included opinions on the agricultural quality and water availability of the country he passed through, notes on geological features of possible economic value (e.g. coal, limestone, pipeclay), and timber resources. Indeed to a large extent, he became as interested in the surveying aspects of his expeditions as in the botanical aspects.

In the 1820s and early 1830s there was intense speculation on the courses of the rivers flowing west from the Dividing Range. Cunningham became familiar with most of them as he criss-crossed the western slopes and plains of New South Wales. Some thought the rivers flowed into an inland sea, but Cunningham did not favour this view. He had seen the Lachlan and Macquarie marshes and realised the flow was too little to sustain a large body of inland water.

In 1829 he visited Moreton Bay to see if, as some suspected, the Brisbane River arose in the Macquarie Marshes. He was able to show that on the contrary, this was a river with its source on the eastern side of the range.

Cunningham was bitterly disappointed when in 1828 Governor Darling favoured Charles Sturt to lead an expedition to trace the Macquarie and other rivers north-westwards. In this expedition Sturt found the upper reaches of the Darling River, and speculated that it flowed south to meet the Lachlan, Hume and Murrumbidgee. Cunningham agreed that the Darling was the sink for other rivers that he knew – the Macquarie, Bogan, Castlereagh, Namoi and others, but thought that the Darling probably turned northwesterly and flowed across the continent to the NW coast. He held to this view even when in 1830 Sturt found what he thought was the Darling flowing into the Murray.

The greatest test of his geographical knowledge came after his return to England. In 1832 a report was received that a runaway convict by the name of Barber had travelled west from Hunters River across Liverpool Plains and eventually met up with a party of aborigines. They took him to a large river they called the Kindur, flowing northwards, which he followed in two expeditions for many weeks, until it eventually emptied into a large freshwater lake on the north coast. On the shores of this lake were hippopotamuses and large baboons, and the shores were visited by men in large canoes, with bows and arrows, who collected seaslugs and scented wood. Cunningham, in a long paper published in the Journal of the Royal Geographical Society was able to show that Barber's Kindur River was in fact the Gwydir, discovered by Cunningham some years earlier. Barber had exaggerated the length of his journey (the Gwydir flowing eventually into the Darling system), and of course the hippopotamuses, baboons and Malay fishermen were imaginary.

Allan Cunningham: zoologist

Although employed as a botanist, Cunningham had a good basic knowledge of zoology, and made collections of shells, insects, reptiles, birds and mammals. Details of these collections and their fate were provided in a paper of 2014 (Orchard 2014).

Several of Cunningham's specimens were used by others for the description of a mammal, a couple of lizards, and some insects. One skink, *Egernia cunninghamii*, which he collected "… in scrubby country in lat. 29°, …on his overland journey from Port Jackson towards Moreton Bay in the winter of 1827" [i.e. somewhere near the Queensland/NSW border, adjacent to Darling Downs], was named in his honour

Cunningham's activities as a collector were closely observed and copied by others in his expeditions. There was after all a ready market at the time for natural history specimens. Septimus Roe, midshipman on the Mermaid with King (and later Surveyor General in Western Australia) wrote in letters to his brother:

> During our short walks for recreation on shore, when we feel happy in being able to emerge beyond the narrow limits of our little quarter deck, our Time is not thrown away, for both Mr. Bedwell & Myself (the Botanist likewise, of course) are making a collection of insects, & mine amount to about 300 different species, carefully preserved in boxes scented with camphire, to guard against invasion from ants, or other destructive vermin... There is such a total want of brown paper in this colony, that I have been prevented from making a very large collection of the plants of this Country, which are said to amount to about 40,000 different species, & having a Botanist on board, the method of preserving them, & insects, is constantly before our eyes.
>
> Letter, Septimus Roe to his father, 22 Mar 1819, written on board Mermaid, Port Jackson. Mitchell Library MLMSS7964 / vol. 4, series 4: Letter no. 7.

An interesting incident is recounted by Cunningham in a letter to Major John Campbell, who was writing a history of the Melville Island settlement. The incident occurred when King, Cunningham and others had landed near Luxmore Head, Melville Island, and were surprised by a band of natives:

> …our anchorage was near Luxmore Head, which we ascended next day…and there encountered the natives, from whom King and the rest ran down to the boat with a devil take the hindmost kind of haste, leaving poor me on the summit of this Head, to put the best face I could upon the Circumstance of our having landed, without the previous permission of the Black fellows being first obtained. In the disorderly way in which my Comrades bolted from me, they left behind them the theodolite stand, and a portfolio full of original sketches, bearings &c of the Coast. The recovery of this latter is due to me, for just as the black fellows were on the point of seizing it with the stand, I called out "I'll just trouble you" & laying hold of this body of documents, begged them to accept my gauze mist net instead! This is the true reading of the story, which however King in his Narration of the Voyages, tells otherwise, which see for yourself in print enclosed. Not influenced by example, I now retired to the boat in an orderly way, seizing in my descent to the boat the Iguana, which my Commanding officer had just previously expended obet [gunpowder]on (see the enclosed) & which proved an interesting Subject to prepare.
>
> Allan Cunningham, Letter to John Campbell, 19 June 1833, Mitchell Library MLDOC 2748.

The lizard in question is not identified in King's account of his voyages, but another collected by Cunningham is described and illustrated. It is the Frilled Neck Lizard collected by Cunningham at Careening Bay, Port Nelson. He described it thus:

> I secured a curious Lizard of extraordinary appearance which I observed had perch'd itself on the stem of a decayed small tree. It has a curious crenated Membrane, like a ruff or Tippet round its neck and covering its shoulders, & when expanded, which it is enabled to do, by means of transverse slender Cartilages, the appendage spreads 5 inches, in form of an open Umbrella, when it is seen to be only connected round the Neck of the Animal, excepting at the back part, where it is open, being lobed or auriculated. The use of this membranous Appendage may be either to alarm an Enemy by the terrific aspect

> it can suddenly present by its quick Expansion, or perhaps to break an accidental fall in its Escape from a foe & to assist it leaping from tree to tree. I regret that eagerness to secure so curious an Animal did not admit of suffic[t] time to allow the Lizard to show fully any consid[ble] Degree of alarm or Irritability, or how far it depended upon this extraordinary Membrane in such Extremities, wherein it feels its life is Endanger'd. Its head was rather large, Eyes prominent, & from the tip of the nose to the Extremity of Tail exceeded 12 inches. It appears related to Draco volans, from which however it is abundantly distinct. Its tongue altho' bifid, appeared short and thicken'd, perhaps tubular, but it did not dart it at flies, as is common to Lacerta.
>
> Allan Cunningham, Journal, 28 September 1820

Cunningham was also instrumental in describing the anatomy and habits of the Kiwi. In a letter to Robert Heward written on his final visit to New Zealand he said that he had bought:

> …a specimen of that rarest of all birds of New Zealand, the Kiwi (Apteryx australis) which I shall forward home to Mr Yarrell, for the Zoological Society.

and in a letter to Robert Brown:

> …whilst in New Zealand I obtained at some cost in money a live Apterae or Kiwi of the natives. I killed the bird, prepared the specimen of the skin & placed the body in a large jar in spirits. The former I sent to Mr Yarrell for the Mus. of the Zoological Soc. The latter to Mr Owen for dissection.

Richard Owen, Curator of Natural History at the British Museum, is believed to have used the material in preparing a paper on the anatomy of the Kiwi.

Cunningham also wrote a short paper, published posthumously in 1840 in the *Annals and Magazine of Natural History*, describing what was known of the habits of the Kiwi, gleaned during his visits to New Zealand in 1826 and 1838.

Allan Cunningham: geologist

Cunningham frequently noted the rock types underlying his collection sites, and commented upon potentially economically useful deposits. The following examples are from the Oxley Expedition of 1817 to trace the courses of the Lachlan and Macquarie Rivers:

> Descending to the Creek call'd Limestone Creek, we halted and encamp'd on the opposite Bank … It is a Subject of regret that these Limestone Rocks are so far distant from the habitation of Man as to be of no use to him."
>
> Cunningham, Journal, 23 April 1817, "63 miles W of Bathurst.
>
> Some of the Hills produce a slaty stone. It is the opinion of some of us that Coal might be found beneath its surface.
>
> Cunningham, Journal, 26 August 1817, c. 40 miles N of Mt. Lachlan
>
> I observed on a lofty Hill about 5 Miles on our Journey some good Specimens of Blue Slate, in thick laminae, which I traced down its declivity to a deep running rocky Gully of Water. Mr Oxley was of the opinion coal might be found beneath it, but the difficulty of turning such Productions found here to any Colonial use or Benefit, on account of the extreme rugg'd nature of the Country, render its examination scarcely worth the Expenses it would naturally incur. We found likewise some Specimens of Iron Stone.
>
> Cunningham, Journal, 27 August 1817, c. 35 miles N of Mt. Lachlan

He sent occasional rock specimens home with his plant consignments. On his return to London he presented his main geological collection to the Royal Geological Society, but these specimens can no longer be found and are presumed lost.

His only published geological contribution was a paper on the geology of the western slopes of New South Wales between Hunter's River and Moreton Bay, published in *Proceedings of the Geological Society of London* in 1834-35.

Allan Cunningham: plant geographer

Plant geography was scarcely a science in the 1820s, but as ever-increasing numbers of specimens poured into Europe from all over the world in the late 18th and early 19th centuries, it gradually became a subject of serious study. Cunningham was an early contributor. I have already mentioned his letters to Charles Telfair

in Mauritius. In these he began to speculate on patterns of plant distribution in northern Australia, in particular:

> The Geography of Botany, or the distribution of certain Families, Genera or species of plants, in different parallels of latitude, is a science as yet in its infancy in Europe. It is a study I have not neglected. The Voyages of Captain King gave me many fine opportunities of observing the diffusion of our Australian Vegetation as well intertropical as extratropical, as well as comparing the flora of our Eastern Coast with that of the Western shores, and that too, on the same parallels – at their opposite Extremes. Thus in the parallel of 15˚ on the East Coast, that is on the Eastern Extreme, I find a curious identity of species, with those of its western Extremity on the N.W. Coast, and as this parallel cuts the Gulf of Carpentaria, on which shores the same subjects present themselves, I infer that at spaces throughout the Continent there exists the same description of the vegetation, those species which grow in salt water and usually lumped under the head of Mangroves being exceptional.
>
> Cunningham, letter to Charles Telfair, 1 August 1824, RBG Kew, Director's Correspondence vol. 43, f. 35

When King published the Narrative of his Voyages in 1827, he invited Cunningham to provide a botanical Appendix. In this Appendix, running to 30 pages, Cunningham set out a detailed exposition of the distribution of plants, by families and major groups, across northern Australia. He expanded on his note to Telfair by providing a list of 48 species common to the east and west coasts at Latitude 15° S, as well as a list of 52 species of plants of northern Australia shared with India or South America. This was the first attempt at an Australian plant biogeography, and one of the first in the world. It predated Joseph Hooker's account of Australian plant geography by some 25 years.

Allan Cunningham: anthropologist

Whenever he could, Cunningham tried to communicate with the aboriginal inhabitants, and in his journals provided notes on their lifestyle. This was not possible at Endeavour River, and in places on the north coast where Macassan fishermen had aroused hostility, but in Tasmania in particular, and in many places on the north-west coast he and King had interesting and productive meetings with the local inhabitants.

A good example of his observations is the description of an encounter with a group of aboriginal men paddling on rafts between islands in the Dampier Archipelago:

> Our People soon overtook the 3^{d} Man, who had not been so active in working to Windward as his Comrades, and with difficulty and with as much care as possible, he was seized and lifted into the Boat, but not before he had dived two or 3 times under the bottom in attempting to escape.
>
> Upon being brought on board, we were presented with a fine figure of a Man of rather thin spare shape, about 6 feet 2 inches high, of a good visage as an Australian, strong bushy beard, tolerably well proportion'd Limbs and apparently 27 or 26 Years of age. He was not wanting in the Incisors or Front Teeth, nor was the signs of Circumcision visible, spoken of by authors. He was perfectly naked, tatoo'd on the Breast, wore no ornaments, having only a pointed stick about 7 inches long stuck in his Hair that might be useful to extract Fish from their shells or other purposes.
>
> Altho' sullen and much alarm'd at first, he soon assumed a Degree of Confidence, when he experienced the Kindness and attention paid him. He occasionally made signs toward the Land and Talk'd, but his Language was not understood by Bongareē our Port Jackson native, or ourselves.
>
> We decorated him with Glass Beads, which we hung round his neck, but (like the natives of other Australian Tribes) he was not disposed to admire these ornaments, preferring, rather, useful and beneficial things. He ate but sparingly of our Biscuit, but drunk freely a quart of Fresh Water. He took much notice of Bongareē who had reluctantly, at our Persuasion, strip'd and exhibited a scarified Body as counterpart of his own.
>
> By this time we had approached so near an Island as to be within 1¼ Miles of its shores, on which we observed many Natives patiently watching us, and apparently in anxi-

ety to know the Result of the Capture. We therefore shorten'd Sail and anchored in 5 fathoms. We gave the Native an Axe (shewing him its use), a Bag containing Beef and Biscuit, a red cap, and some small cordage, and expressing a Desire to depart, he was taken off in the Jolly boat for the Beach on which his Countrymen were sitting, the officer of the Boat having directions not to land him, but to approach the Shore, place him, with the Gifts round his back on his Float, & launch him off. He soon landed on the beach, but his Comrades approach'd him very cautiously with the spear poised over their shoulders, while others more timid ran back behind the Bushes. This strange Symptom of Fear & Mistrust entirely originated in the Figure the captured Native made, with the Bag at his Back, and the Red Cap on his Head, but soon disengaging himself of these Encumbrances, and throwing the whole carelessly on the Sand, he join'd his Comrades, whose number including Women and Children was between 36 and 40. We were at a loss to know the kind of wood of which this simple kind of float or Bark was made. It is about a foot Diameter and might be 7 or 8 feet long, solid and cylindrical, is tapering slightly towards the extremes, which were detach'd pieces join'd by means of sticks forced into the Ends of the Main piece. They sit upon it about the middle, astride, allowing their Legs to hang down in the Water, or can at pleasure, place their feet horizontally across the Float, resting the Heel on its forepoint. Practice and Habit have enabled them to sit so in equilibrio as to prevent their bark turning with them, and when they wish to advance rapidly, they incline their Body forward, put their feet in motion, and paddle with their hands. The Head of the float is only seen, the greater part being under water, Diagonally to its Horizontal surface.

Cunningham, Journal, 26 February 1818

Allan Cunningham: agricultural consultant

Both because he had walked over large areas of New South Wales, and because of his botanical expertise, Cunningham was frequently consulted on agricultural matters. For example, Alexander Riley, writing instructions for ?Edward Riley said:

I should be very desirous of having the information of Frazer & Cunningham the botanists on the relative capabilities of the soil &c of Burwood and Ousedale, and to what purposes they are either most capable of being profitably devoted, before I determine on parting with them – of this I shall however instruct Dutton, but nevertheless if you have opportunity court the Information of such valuable practical men.

Alexander Riley, letter to ?Edward Riley, 3 November 1828, Mitchell Library A 108, f. 119

Cunningham's main contribution in this field, however, came in the form of an enquiry from the colonial advisory committee of the newly incorporated Australian Agricultural Company. The committee consisted of Hannibal Macarthur, James Macarthur and James Bowman. They asked for advice on suitable land to take up in the colony. Cunningham provided them with a lengthy discussion paper on the merits of various areas, and recommended the country he had seen to the north of Hunter's River and south of Liverpool Plains in his expedition of 1823. He suggested that Liverpool Plains might offer better prospects, but at that time he had not fully explored it. The company subsequently took up land near Port Stephens as part of its 1 million acre entitlement, later swapping it for land on the Liverpool Plains. Cunningham's former commander and friend, Phillip Parker King, was one of the Directors of the Port Stephens holding.

Allan Cunningham: linguist

Cunningham and King very quickly realised that the languages spoken by the natives at their different landing spots were vastly different. They had taken Bongaree, a Sydney native, with them as translator, but he was very soon unable to understand any of the languages either. Cunningham and King tried hard, whenever friendly relationships could be established, to glean as many words of the local tongues as possible. King published some of these in his Narrative. Cunningham listed many more words in his Journals. Towards the end of the King voyages he even prepared a comparative table of words from Port Jackson, King George Sound (both his own and Flinders

account), Endeavour River, and Tasmania (after D'Entrecasteaux). Cunningham had also translated a few words himself from Macquarie Harbour in Tasmania. This table clearly illustrated the vast differences in language from different parts of the country.

Allan Cunningham: social commentator

Very few of Cunningham's private letters to friends and colleagues have survived, which is a pity, because in these he displayed a side of his character at odds with the formal reporter to authority. He showed an empathy with people of various classes, and a dry wit. I shall give just a couple of examples.

Cunningham was brought up in the Protestant Scottish Church, and probably had little experience of other religions during his younger years. When he arrived in Catholic Brazil it was a major culture shock. He was endlessly bemused by the impact of priests and the church on daily life, and often found the padres somewhat a figure of amusement. On the other hand, it was the padres who offered him and Bowie the greatest assistance on their overland expedition to Sao Paulo.

As an example, during 1816, the Dowager Queen of Portugal died in Rio de Janeiro, and State Mourning was declared. Cunningham described part of the proceedings as follows to his brother Richard:

> …there are orders that if any person whether Portuguese or stranger Walks without a black Crape in his Hat, they will be seized by the Police & fined, and for the second offence 30 days Imprisonment & fined 6/-. I am of course bound to put a Crape in my Hat ...The Entombment took place on Sat^{y} 23rd at 12 at night and lasted till 4 on Sunday Morn. All the Padres or Priests were on horseback & for ought I know to the contrary might have been the first debut on the back of a Horse at least for many of them. They seemed lost on such an eminence & many could not set steady & moreover many of them upon mounting at the Palace raised their left leg on the right side of the beast, which perforce occasioned a great confusion, as some of the Horses started off with them in this position. In all public Processions the priests always walk singing anthems & carrying a large lighted Wax Candle 4 feet long & 1 Inch diameter, but as this was the first occurrence of a Queen of Portugal dying here, they are allowed a Horse each. Hence many of these learned Brazilian Divines having had but this solitary opportunity of practising Horsemanship, & that before a large Concourse of Spectators as well as upon young spirited Horses, certainly pleads excuse for them.
>
> The Padres led forward the Procession. The Corpse was carried in a Coach drawn by 6 Horses, followed by the Prince, Princesses &c &c Bishops &c all in Coaches and which were covered with black Crape. Then followed the Noblemen with Lambeaus. What with the darkness of the Night notwithstanding the Candles & the black Crape, the whole had a very sable appearance & without doubt the funeral dirge, the dismal music, with muffled drums, added much to the solemnity of it. Having seen them make a start I followed them in my turn, but upon calculating upon the possibility of being captured by the Police for having no token of black about me, I took my own advice & immediately passed down the Rua du Reite, then passed the Rua des Barberios, crossed the Rua de Cano into the Rua D'Onvidor & from thence got into the Rua des Invalides. From thence got me home to Matto Cavallos. All the Guns not only of the Forts but also of the shipping in the Harbour were obliged to fire a Gun one after the other every five minutes day & night for 3 Days. An extravagant waste of powder which they might ere long turn to better account. On the 28th Stages were erected in all the Public places in the City for the purpose of demolishing the property of Her late Majesty. All her household furniture it was said was to be broken to pieces, but only a few Chairs as I was told were demolished. The Officer of the Royal Household ascended the Stage with a Chair in his Hand, the legs of which were nearly sawn thro' in order that he might not overstrain himself in attempting to break across his knee legs of chairs made of Wood as hard as Iron. He gives them the last crack, informing the wondering Brazilians why & whereinfore this Wanton destruction takes place, vizt. as Her late Majesty's had died and consequently ceased to reign, it was an old Custom in Portugal

> to break up the Royal Deceased's Furniture which could not possibly be of any Service to any other person.
>
> Cunningham, letter to Richard Cunningham, 23 March1816, RBG Kew Archives, Kew Collectors KCL/5/1, ff. 175, 176

A final anecdote from Cunningham's time in London in 1831-1836. He was living at Strand on the Green across the river from Kew. One of his neighbours was a retired Milliner. On occasion Cunningham was invited to dinner, as he told King in a letter of 23 April 1836:

> My friend the retired "merchand de flanelle" occasionally has a large party at dinner, of persons on the same retired [?host], and of very similar mental calibre. I am always asked to form one of the party, to "divide the Ladies at the table" by sitting between a pair of elderly personages, and (as both of them have left off reading for years, & only by hear-say know how the world is going on) to amuse both, and thus prevent drowsiness, which otherwise would be inevitable ere the 3^{d} Course reached us. In return for one of my reminiscences of what I had seen in the remote parts of the Globe, one of these ladies, viz. the one on my right, gave me a dish of her recollections when in her teens, a positive age ago! The subject was the great changes that had been brought in the course of the last 50 years in all things. "look at the Ledgitamate dramy", rising an inch as she made the appeal to me, "where are your Kembles, your Siddons in Tragedy, or your Grimaldis in pantomine now? In my youthful days, and I remember John Palaser at the Royalty Theatre, the playhouse was worth going to see, but now, I go nowhere except to Madames olympic, to see what Vesteres calls her Waudewilles & to laugh at Liston for 4 Hours". I could not but admire her good taste. The Lady resumed "But all things have changed, when we first entered on extensive business, a few servants were only necessary as assistants, but now before we retired, our establishment was obliged to be doubled, several were half gentlemen & were required to speak French, and we kept a poet at 3 Guineas a Week to puff our goods in verse, as well the rhyming as the blank, but for these we could have sold nothing, for even "Warren the blacking Man" finds such a personage indispensible to his profession". This occurred lately. I was greatly amused… I thanked this Lady on my right for the comprehensive view (so to speak) she had taken of the change in the Times in ½ a century, but the next time she sits on either side me at my friend's table, and helps me to shrimp sauce, I'll just trouble her not to pour it over my salmon, but to deposit it on a detached portion of my plate, giving me more than a solitary shrimp, & less butter!"
>
> Cunningham, letter to Phillip Parker King, Mitchell Library MLMS 7048/1/3-5, Phillip Parker King – Letters received 1817- ca 1870s, f. 3

Such was Allan Cunningham, the man whom Governor Macquarie once complained to Banks was an "unbred illiterate man". That comment said more about Macquarie than Cunningham, and Banks agreed. Cunningham was universally liked and admired by his contemporaries in Sydney, and by the scientific establishment in London. His death at the age of just 48 brought an untimely end to the career of a man of formidable intellect. We have however an immense treasury of botanical knowledge accumulated by him, that we are still mining 200 years later.

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The annual ASBS conference

Systematic botany – a view from the Centre

ASBS Conference Report

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In late September 2016, a series of long-distance dispersal events resulted in Alice Springs being converged upon by botanists predominantly from Australasia, but some from even further abroad. The dispersal coincided with an unusually early start to the annual Australasian Systematic Botany Society (ASBS) conference season. The conference, held from 26th–29th September and aptly named "Alice Springs: A View from the Centre", promised three days of cutting-edge botany, as well as several social events and a post-conference field trip to the stunning Standley Chasm and Ellery Creek Big Hole. But did the conference bloom into the promised inflorescence of knowledge? Or did it fail to germinate? Read on to see.

The pre-conference welcome event was held on the evening of September 25th at the Yubu Napa Art Gallery. Amid a backdrop of beautiful indigenous art, a stream of familiar (and some new) faces converged to receive welcome packs, consume much-appreciated drinks, and swap conversation like 'Gee, it's hot here, isn't it?' The spirit of the event was wonderfully documented in some artistic photographs taken from the CCTV system at the gallery. After a stirring welcome to Alice by Peter Jobson, the drifting scents of the local KFC aroused the hunger of the mob of botanists, who dissipated to dine and prepare for the conference ahead.

The conference officially opened on Monday 26th September at the DoubleTree by Hilton. Attendees were comfortably seated in one of the spacious ballrooms, and were warmly welcomed to country by Kumalie (Rosalie) Riley, an indigenous elder of the Arrernte people who are the traditional owners and custodians of the land on which the conference venue is sited. The keynote speech was delivered by Dr Mark Chase from the Royal Botanic Gardens Kew and the University of Western Australia. His presentation was a fascinating look into a new paradigm for polyploidy and diploidization using *Nicotania* section *Suaveolentes* as an example. Mark's hypothesis about the evolutionary advantages that these phenomena afford was well received and provoked plenty of discussion, so much so that Sarah Mathews was spurred to change her presentation topic to a discussion of polyploidy! We all certainly had far more than just biscuits and coffee to digest during the morning tea session.

In the later session, John Clarkson informed us on the threat that many naturalised pastoral grasses pose on the native biota. We also heard talks on some challenging taxonomic groups, including Matt Renner's work on the Australian liverwort family Plagiochilaceae (with his presentation as entertaining as ever), and Javier Aju's work on *Archidendron* (presented by Gillian Brown). Each year the conference attendees are psyched up for cycads, and thankfully James Clugston didn't let us down, despite the disjunct distribution between Alice Springs and his location in the UK. James was a recipient of the Australian Conservation Taxonomy Award for Botany in 2015, and went above and beyond to provide a recorded video of his presentation dealing with his ongoing PhD work on the population genetics of *Cycas calcicola*. Ilse Breitwieser discussed the recent 'roadmap' reports released by the Royal Society of New Zealand that highlight the necessity of recognising and protecting the nationally important taxonomic collections in New Zealand. The reports have had some positive outcomes already with some funding allocated to collections by the NZ government. The remaining talks in the afternoon session had a common theme: the various resources available for taxonomy and systematics. Ian Cowie gave a presentation on the development of the online keys to the flora of the MacDonnell Ranges Bioregion (MacFlora) on the FloraNT website (Web ref. 1). Joel Collins spoke of his experience using mobile apps to collect, store, and manipulate data while in the field, which sparked some spirited debate about the relative merits of mobile technology vs pen and paper. Ryonen Butcher gave an enthusiastic talk on the ALA, including different ways we can filter the

data and improve their quality for future users. Anthony Whalen discussed the grant schemes available through the ABRS, causing more than a few students to jerk to attention, and reminded all attendees about the Taxonomic Capacity Survey. Finally, Kevin Thiele gave a fantastic demonstration on how to use and edit keys on eFlora, with an impressive, *totally* unrehearsed feature by Miguel de Salas providing some knowledge of Tasmanian *Drosera*. The ASBS 2016 AGM was held at the conclusion of Monday's presentations, and highlighted the very positive state of the society.

The second day of the conference kicked off with an awards ceremony that announced Anthony Orchard as the winner of the prestigious Nancy T. Burbidge medal. Tony went on to give a wonderful presentation on the life and work of celebrated botanist and all-round natural historian, Allan Cunningham. Following the address, the poster session was held during morning tea. Charles Foster was awarded the Australian Systematic Botany Prize for his poster titled "There goes *Thecanthes*: molecular systematics expands the circumscription of *Pimelea* (Thymelaeaceae)". The next round of sessions focused on biodiversity evaluation. Dan Murphy discussed the changing ways in which endemism has been assessed and defined over time, and Hugh Burley presented his work on the quantification of the biodiversity of the Australian wet tropics. Nicholas Cuff's presentation focused on the difficult-to survey, short-range endemic taxa of *Typhonium*. This talk was particularly memorable for another reason; to evade the squeaking pink pig chosen as the conference's timekeeper and inadvertent mascot (Fig. 1), Nicholas produced his pig eradication licence. Maarten Christenhusz, the final speaker of the session, gave a fascinating talk on the cultural and phylogenetic significance and history of *Tulipa*.

After lunch, we were treated to a diverse range of talks. Isaac Kerr presented his work on a *Ripogonum*-wannabe fossil from the Oligocene of New Zealand. The presentation was especially impressive considering it was based on research from his yet-to-be-completed Honours year. Jessica Bruce presented her work on *Reedia spathacea* and other co-occurring, rare taxa. Jessica was praised for her critical approach to determining whether *R. spathacea*

Fig. 1. The President and The Pig. Ph. M. Waycott

was truly a relict taxon. Rachael Fowler talked about her impressve and exhaustive revision of *Eremophila*, with her impending taxonomic decisions provoking perhaps the largest and most controversial discussion of the conference. Ed Biffin spoke of the changing face of pigface research, including the challenges of identifying co-occurring native vs naturalised *Carpobrotus* and their hybrids, and the importance of molecular identification. Jürgen Kellermann presented his ongoing treatment of the Rhamnaceae for the *Flora of Australia*, for which he was to be awarded one of the inaugural awards at the completion of the conference for his 'extended' discussion. Kerry Gibbons discussed her work on '*Mitrasacme* alliance' and some interesting, potentially functional, morphological trait relationships. Nick Kalfas provided an overview of his work on the co-evolution of two closely associated monotypic genera: the Albany Pitcher Plant, *Cephalotus follicularis*, and a wingless, stilt-legged fly, *Badisis ambulans* (Fig. 2a). Despite his frank admission that he felt like a fraud presenting what he thought to be not-strictly-botanical work, Nick's passionate and thorough talk was well received by all at the conference. Charles Foster presented his work on the angiosperm evolutionary timescale, including the impact that various components of Bayesian molecular dating can have on age estimates. For the final talk of the afternoon, Tim Collins talked about his fascinating work on a newly discovered,

Fig. 2. Left to right: a, Nick Kalfas presenting his co-evolution story; b, Peter Jobson at his best at the dinner, with Mike Fay at the left, the Browns in the rear, and Tony Orchard to the fore.

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undescribed, fertile hybrid of *Eucalyptus magnificata.* For this presentation, Tim was awarded the Pauline Ladiges Prize for the best oral presentation by a student.

The second day of the conference was due to conclude with a quick forum to discuss progress toward the Decadal Plan, but the substantial and passionate response required a decision to be made to postpone significant discussion until the following afternoon, lest the official conference dinner be disturbed! The dinner was held at the Olive Pink Botanic Gardens (Fig. 2b, 3) and attendees were treated to a Northern Territory feast, catered by Kungas Can Cook. The dishes on offer included a bush tomato and kangaroo lasagne and camel green curry, and were well accompanied by fine wine in fine mugs.

The final day of the conference began with Sarah Mathews's work on diploidization without condensation, which provided a fantastic look at an alternate scenario to Mark Chase's earlier talk on diploidization with genome condensation. Next, Tanja Schuster discussed her work investigating the systematics of eucalypts using full chloroplast genomes. Tanja's excellent talk concluded with the findings that *Corymbia* may not be monophyletic, leading to audible groans and exclamations of "here we go again!" from the audience. Mike Fay talked about the evolution of genome size in angiosperms using Liliaceae and Melanthiaceae as examples, and informed us all of the genome obesity epidemic in monocots. Caroline Pannell presented her ongoing work into the distribution of *Aglaia* and associated animal dispersers. Caroline's talk was fascinating, and provided evidence of the importance of taxonomic expertise derived from long-term research (over four decades!) Kristina Lemson spoke of the challenges involved in characterising a species with plastic vegetative morphology.

The second session's talks had a common theme of 'taxononomic stocktaking'. Kevin Thiele explained the origins of the KeyBase project and his ongoing quest to provide keys to all of the Australian plant taxa. Ian Cowie demonstrated the FloraNT system and many of its capabilities, including access to the NT Herbarium's specimen data, generating taxon fact sheets, and conducting spatial searches. Richard Boyne provided us with a fascinating insight into his time at the Royal Botanic Gardens Kew, including efforts to digitise the vast specimen collections. We were all reminded of the benefits of finding the best of bad situations by Richard's example of the annexation of Crimea being unexpectedly fortunate for his work. Yu Ito recounted efforts to determine the biogeographic origins of the ecologically diverse *Eriocaulon*. Korjent van Dijk discussed efforts to protect *Eucalyptus paludicola,* a very rare eucalypt that was found to be an infertile hybrid.

The final session began with Jennifer Tate talking about the evolution of sexual dimorphism in Malveae. Melodina Fabillo gave an enthusiastic presentation on efforts to survey *Eremochloa* as part of an ABRS study

Fig. 3. At the dinner at Olive Pink Botanic Gardens. Left to right: a, Plenty to talk about, with clockwise at the front table: Miguel de Salas, Sarah Mathews, Jen Tate, Juliet Wege, Ilse Brietweiser, Heidi Meudt; at the left rear Ed Biffin, Juergen Kellermann, at the right rear: ?, Mark Chase, Mike Fay, Kristina Lemson; on the right (partially): Rosemary Purdie; b, Rosemary Purdie, Tony Orchard with Peter Latz, at the rear table at the front Austin Brown, Laurie Haegi, John and Jan Hosking; at the right rear Debbie Randall (glass), Anthony Whalen, Molly Whalen, Matt Renner.

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on subtribe Rottboeliinae, including amusing insights into some of the unpredictable pitfalls of field research. Trevor Wilson discussed his work on micromorphological characters to diagnose relationships within *Plectranthus*, and showed us some beautiful photos of both these features and from some of his enviable field trips. The final presenter, Heidi Meudt, discussed species delimitation within *Myosotis*, including the somewhat surprising utility of pollen characters.

After a short afternoon tea break, we had a surprise visit from the National Threatened Species Commissioner, Gregory Andrews. While Gregory spoke mostly about animal recovery, where his experiences mainly lie, we also gained some insight into the recovery targets for some plant groups. He also discussed Kingsley Dixon's seedbank initiative, whereby 100% of threatened species will have seeds banked by 2020 for propagation into the future. When the floor was opened up to questions, concerns were raised over our ability to protect threatened species on private land, and whether the government was aware of the importance of taxonomic and systematic research to conservation. We were all assured by Gregory that he is on our side, and that our difficulties will be considered if we make our voices heard. Afterwards, we returned to a further discussion of the Decadal Plan, followed by the awards ceremony. Peter Jobson concluded the conference with a moving, heartfelt speech, before handing the conference over to Michelle Waycott to introduce the 2017 ASBS location: Adelaide.

Following the conclusion of the formalities, there was a BBQ at Simpsons Gap. The natural beauty of the location was appreciated by all, with plenty of local flora flowering, and the occasional hint of a rock wallaby within the maze of boulders. The BBQ itself was served from the back of a ute under the outback stars, which added to the charm of the event. We were also lucky to be treated to an impromptu talk about the historical ecology of the region by local legend Peter Latz.The following day, an excursion was made to Standley Chasm and Ellery Creek Big Hole for the post-conference field trip. While neither of us could attend this event, by all accounts it was a fantastic trip.

Overall, the conference was very well planned and executed, with Alice Springs proving to be a great location. The breadth of talent within

ASBS provided a fascinating selection of talks and demonstrated that the future of plant systematics and taxonomy within Australasia is in good hands, although the amount of difficulties that the conference laser pointer caused was a little worrying. It's always a pleasure to attend ASBS conferences, and now we can't wait for Adelaide next year!

For those who weren't able to attend the conference, the abstract booklet is available at the conference website (Web ref. 2). Eds.

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1. *http://eflora.nt.gov.au*
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Field trip report – ASBS 2016 meeting Alice Springs

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Who better than two North American mid-westerners now living in New Zealand to share their excitement of being on the field trip following the meeting in Alice Springs? We were definitely not alone in our enthusiasm nor lack of knowledge of the local Northern Territory flora. Indeed, this region is so unique that folks from around Australia were asking just as many questions as we were about the plants encountered.

Around 40 delegates, representing about 2/3 of the conference attendees, awoke to clear blue skies and gathered at the conference venue for an 8 am departure. Peter Jobson, our guide extraordinaire, kindly had extra water on hand for everyone as it was meant to be a warm day (but only 22°C, which is cool by Alice standards). The bus was full of chatter even at the early hour as folks relived the conference days and the previous night's BBQ at Simpson's Gap. We didn't hear anyone break out singing showtunes though…

Driving out to the West MacDonnell Ranges, Peter (aka Jobbie) told us some of the history of the area. It was amazing to learn that this area was once the edge of the continental shelf, some 500 million years ago. Reflecting on this long history and the significance of this land was humbling. We arrived at the Jay Creek tributary and piled out of the bus, cameras at the ready. I'm not sure who was the first to start snapping photos, but it is likely that the same poor plants were snapped by 40 eager botanists traipsing by. Joining up with part of the Larapinta Trail, we walked up the dry riverbed through the gorge. The height of the sheer cliffs was impressive and we found ourselves marvelling at the colour of the rock underfoot and on the cliffs above. Some favourite plants seen in this area were *Corymbia aparrerinja* (the ghost gum), *Dodonaea viscosa* (sticky hopbush), *Acacia stronglyophylla, Indigofera basedowii* (silver indigo), *Hibbertia glaberrima* (desert buttercup), *Olearia stuartii*, *Trichodesma zeylanicum* (cattle bush), *Stemodia viscosa*, and the impressive *Macrozamia macdonnellii* (MacDonnell Ranges cycad).

After a slight scramble up from the gorge, we emerged onto a plateau before heading

Fig. 1. Off the bus at Jay Creek. From left, Nick Kalfas, Kor van Dijk, Jess Bruce, John Clarkson, Tony Orchard, Kerry Gibbons, Tessa Orchard, Ed Biffin, Miguel de Salas, Nanette Hooker, Matt Renner, Kerry Gibbons, Cate Tauss, Juliete Wege, Gill Brown, Juergen Kellermann, Ilse Breitwieser, Peter Jobson, Trevor Wilson, Ainsley Calladine, Jen Tate, Sarah Mathews, Kristina Lemson. Ph. H. Meudt

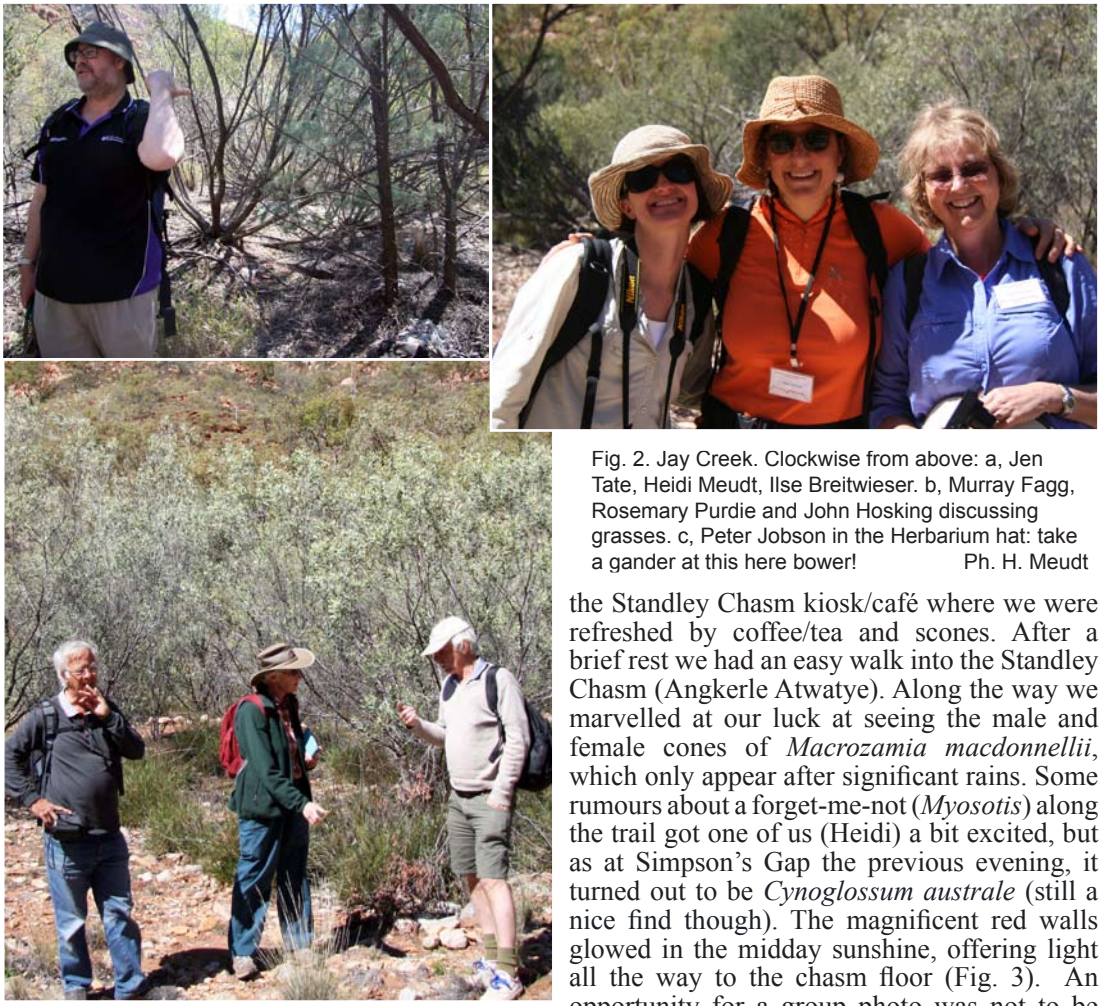


Fig. 2. Jay Creek. Clockwise from above: a, Jen Tate, Heidi Meudt, Ilse Breitwieser. b, Murray Fagg, Rosemary Purdie and John Hosking discussing grasses. c, Peter Jobson in the Herbarium hat: take a gander at this here bower! Ph. H. Meudt

up to the saddle. A bower (made by a bower bird) elicited quite a bit of excitement out of the group of botanists (Fig. 2c) – precise piles of white stones, plastic cups, and straws, and green plastic and bottle caps. Dan Murphy managed to record a video of the bower bird screeching at him as he stood by admiring the bird's handy work. As we started the climb up to the saddle, the vegetation changed to more xeric scrub with *Callitris glaucophylla*, *Abutilon leucopetalum* (lantern bush), *Sida phaeotricha*, *Hybanthus aurantiacus* (orange spade flower), and the parasitic *Amyema maidenii* (pale leaf mistletoe) and *Lysiana exocarpi* (Harlequin mistletoe), and goodness knows how many species of *Eucalyptus* (don't ask us, these died out many millions of years ago in New Zealand!). Some folks climbed the steep path to the ridge and were rewarded with spectacular views from the lookout.

A stroll down the other side of the hill led us to the Standley Chasm kiosk/café where we were refreshed by coffee/tea and scones. After a brief rest we had an easy walk into the Standley Chasm (Angkerle Atwatye). Along the way we marvelled at our luck at seeing the male and female cones of *Macrozamia macdonnellii*, which only appear after significant rains. Some rumours about a forget-me-not (*Myosotis*) along the trail got one of us (Heidi) a bit excited, but as at Simpson's Gap the previous evening, it turned out to be *Cynoglossum australe* (still a nice find though). The magnificent red walls glowed in the midday sunshine, offering light all the way to the chasm floor (Fig. 3). An opportunity for a group photo was not to be missed, even by the Treasurer, who arrived just in time. This is an important place in the desert as a freshwater spring runs up and along the trail. Unique plants are found in this chasm such as *Goodenia grandiflora*, *Actinotus schwartzii* (desert flannel flower), and *Cremnothamnus thomsonii*.[1] We also saw at least two ferns, which was a pleasant surprise in this hot and dry environment.

After a short bus ride, our final stop of the day was to Ellery Rockhole, another significant place in the desert with water and with a markedly different flora growing on limestone soil. Notably, although along the roadsides Buffel grass (*Cenchrus ciliaris*) dominated, on top of the limestone hills it could not compete with the natives. We walked up to the top of a small ridge (Fig. 4a) and found the area dominated

[1] Ever unbiased, the Editors must add *Hakea standleyensis* Maconochie to such lists.

Fig. 3. Standley Chasm: where are the flowers? Left, at the front: Jan Hosking, Caroline Pannell, Murray Fagg (back), Rosemary Purdie; midground: Connie Spencer, Matt Baker, Jen Tate, Heidi Meudt, Miguel de Salas, Juergen Kellermann, Kor van Dijk, Laurie Haegi, Jess Burdon and friend. Right, Ed Biffin, Jobbie, Ainsley Calladine.
Ph. M. Waycott, H. Meudt

by *Eucalyptus socialis* subsp. *eucentrica* (limestone mallee) and *Triodia longiceps* (commonly called spinifex, which makes botanists cringe). Jobbie pointed out some fantastic gum trees that had regenerated from hearty root stocks after being burned by fires some years ago. Other favourites seen here were *Gossypium sturtianum* (Sturt's Desert Rose) – the state flower of the Northern Territory, *Rhodanthe floribunda* (white paper daisy), the dainty *Wahlenbergia communis*, *Heliotropium asperrimum* and *Eremophila christopheri*.

At this point on the field trip, our heads were spinning with all these new names and plants, the sun was shining brightly and it was quite warm. If only there was somewhere to cool off … Fortunately the organisers of this trip had the brilliant foresight to make sure the last stop on the field trip had a water hole! The itinerary had enigmatically promised a "potential swim" at Ellery Rockhole, and those of us who came prepared with a towel and togs were not disappointed (Fig. 4b): the water hole was massive and full of clean, clear, deep and very cold water. And even though we saw many amazing plants and beautiful places on the field trip, for one of us (Heidi), diving in to that water and floating through the gap in that ancient water hole was hands down the best part of the whole day.

Fig. 4. Ellery Waterhole. a, In ridgetop spinifex listening to Jobbie; at front: Marian Clarkson, Wendy Cooper, Tanja Schuster, Kerry Gibbons, ?, Jobbie, Juergen Kellermann, at rear Jen Tate, Rosemary Purdie, Laurie Haegi.
b, Heidi in her idyllic water hole.
Ph. H. Meudt, J. Tate

News

News from the West

Dr John Huisman has been appointed Curator of the Western Australian Herbarium, having commenced formally in the position on July 1st. This has been a landmark year for John, who has also seen a new genus of red algae named for him (*Huismaniella* G.H.Boo & S.M.Boo; Gelidiellaceae). John is a highly respected algal taxonomist who has been associated with the Herbarium for many years, including through a recent joint position with Murdoch University. He has been affiliated with Murdoch University since completing his PhD at the University of Melbourne in 1986, having been supported throughout his career by a plethora of research grants including several from ABRS and ARC. His career has included a Research Fellowship at the University of Hawaii at Manoa (2002–03), where he worked with Isabella Abbott on the award-winning *Marine Green and Brown Algae of the Hawaiian Islands* and developed his affection for Hawaiian shirts. John is currently describing the marine benthic algae of north-western Australia as part of the *Algae of Australia* series: Volume 1 (green and brown algae) was published by CSIRO in 2015 and he is nearing completion of Volume 2 (red algae). His extensive flora writing experience will no doubt be a fantastic asset as we strive to complete an eFlora of Western Australia.

Over the course of this year, Ryonen Butcher has been working half-time as the Atlas of Living Australia's Collections Community Coordinator, a role that includes liaising between the ALA and the herbarium community to help improve the delivery and retrieval of specimen data, and associated biodiversity information, through the ALA and AVH. In this role, she gave a presentation at the ASBS2016 conference in Alice Springs in September, conducted a demonstration of the new features in the forthcoming 'Australasian Virtual Herbarium' at the joint MAHC/HISCOM AGM in Brisbane in October, and participated in the ALA's user experience (UX) workshop in Canberra in November.

A cursory glance at the Western Australian Herbarium's Facebook page and that of The Wildflower Society of Western Australia will reveal what a fabulous spring it has been across the south-west region. While the Herbarium's botanists have been trying to make the most of the good conditions, the Collections team have been conducting daily curatorial sessions to thin the collection. Now I confess that a very small part of me wishes this meant they were throwing out taxonomically problematic or poor quality collections, but I can assure everyone that this is not the case! The thin involves evenly spreading the collection through the four specimen vaults and will rectify the fact that some genera and families have insufficient space, while others have too much space allocated to them. This is, in part, an artefact of the herbarium move in 2011, when the new PERTH boxes were completely filled with specimens at the old herbarium before being transferred to the new building, thereby reducing the number of boxes that needed to be frozen. This enormous task, which will include relabelling about 48,000 boxes, is expected to take around six months.

The opening of the 2017 Festival of Perth (Boorna Waanginy | The Trees Speak: 10–12th Feb) will explore the biodiversity of the six seasons of South Western Australia by using light, sound and imagery to transform Kings Park. Steve Hopper has been involved in this event and will be one of the panellists in a pre-show discussion on the third and final night of the show (Web ref. 1). The wonderful *Banksia* murals on the Ravensthorpe grain silos by Fremantle-based artist Amok Island are also noteworthy: completed this year, each silo side shows a different stage of the flowering cycle of *B. baxteri* R.Br., a species endemic to the south coast of Western Australia (Web ref. 2).

Frances Ng has recently submitted his Honours thesis at The University of Western Australia, entitled 'Species delimitation in *Banksia* (Proteaceae): four new species in south-west Western Australia'.

Web references

1. *https://perthfestival.com.au/whats-on/events/boorna-waanginy/*
2. *www.amokisland.com/*

Juliet Wege
Western Australian Herbarium

News from the Allan Herbarium, Lincoln, New Zealand

The March 2016 *ASBS Newsletter* reported the departure of Peter Heenan from the Allan Herbarium. With a new appointment now made, it seemed timely to provide some research and collection news from Lincoln.

Dr Jessica (Jessie) Prebble took up a research position at the Allan Herbarium in November this year. ASBS members may remember Jessie as the recipient of 2014 Pauline Ladiges prize for her presentation "The population genetics of rarity in New Zealand plants: a case study delimiting species in recent radiations using *Myosotis* (Boraginaceae)". Jessie recently completed a PhD thesis at Massey University, Palmerston North, supervised by Drs Vaughan Symonds, Jennifer Tate and Heidi Meudt (Te Papa Tongarewa, Museum of New Zealand) on the pygmy *Myosotis* species complex. She has already published papers on *Myosotis*, *Wahlenbergia* and *Veronica*. At the Allan Herbarium Jessie will focus on the systematics of members of the New Zealand seed plant flora.

Phil Novis has several projects addressing various aspects of algal biology. One of note focusses on a newly recognised diatom pest in New Zealand lakes, the so called "lake snot" (Fig. 2). The organism that causes this unpleasant nuisance turns out to be a species of *Lindavia*, but the taxonomy of the genus has a number of fishhooks. Since getting the right names is an essential part of managing invasive organisms, Phil and colleagues have had to provide a valid (if lengthy) name for this one, *Lindavia intermedia* (Manguin ex Kociolek & Reviers) T.Nakov, W.X.Guillory, M.L.Julius, E.C.Theriot & A.J.Alverson ex W.C.Daniels, Novis & Edlund. Or, in a more manageable form *L. intermedia* (Kociolek & Reviers) Daniels et al. In another project Phil is conducting DNA metabarcoding of Ross Sea Sector samples to establish the distribution of microbial species for testing their theoretically predicted responses in a newly constructed Antarctic Simulator (Phil assures us this is not just a freezer).

Reference

Daniels WC, Novis PM, Edlund MB 2016. The valid transfer of *Cyclotella bodanica* var. *intemedia* to *Lindavia* (Bacillariophyceae). *Notulae algarum* 14: 1–2.

Fig. 1. Front row. Kate Boardman, Debby Redmond, Ines Schönberger, Sue Gibb, Jessie Prebble, Phil Novis, Kerry Ford. Back row. David Glenny, Murray Dawson, Rob Smissen, Harper Garthon, Zuri Burns, James Arbuckle.

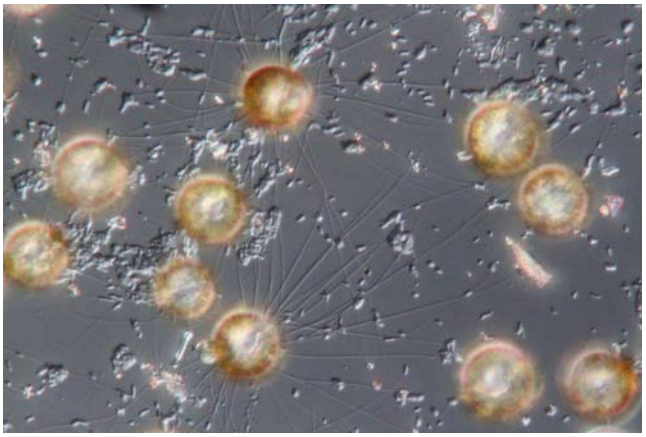


Fig. 2. *Lindavia intermedia* cells showing the mucilage threads that make this organism a nuisance.

Rob Smissen is beginning an ambitious project supported by the Marsden Fund to generate phylogenies of all the plant groups with divaricating species present in New Zealand. These phylogenies will contribute to testing a new hypothesis about the evolution of plant anti-browsing defences by a team led by Dr Chris Lusk (University of Waikato). Genera will include *Olearia*, *Coprosma* and *Pittosporum* and techniques will include whole plastid genome sequencing and nuclear gene capture methods. Hot off the press, Rob recently contributed DNA analyses to a project leading to the description of a new species of the New Zealand endemic grass genus *Simplicia*.

Reference

de Lange P, Smissen RD, Rolfe JR, Ogle CC 2016. Systematics of *Simplicia* Kirk (Poacae, Agrostidinae) – an endemic, threatened New Zealand grass genus. *PhytoKeys* 75: 119–144.

Ines Schönberger (Herbarium Manager, plant ID service) and **Sue Gibb** (cryptogam technician) are currently overseeing the accessioning of the late David Galloway's lichen collections. David, eminent New Zealand lichenologist and Research Associate in Landcare Research's Dunedin office, died on 6 December 2014, aged 72, after a short illness. Sixty-two boxes of his collections are being processed with the help of two students from Otago University (Harper Garthon and James Arbuckle) funded by the Miss E. L. Hellaby Indigenous Grasslands Research Trust.

David Glenny is continuing to work with John Engel (The Field Museum, Chicago) on the Flora of New Zealand Liverworts and Hornworts. One volume is already published and two more are soon to go to the publishers. David is also working on an online interactive key to the willow species present in New Zealand.

Reference

Engel JJ & Glenny DG 2008. A Flora of the *Liverworts and Hornworts of New Zealand* volume 1. Missouri Botanical Garden Press.

Debbie Redmond (herbarium technician) with **Kate Boardman** (database administrator) and Friends of the Herbarium **Charles Graham** and **Jeanette Christensen** have completed a major project to locate and database the first records of adventive plants at CHR. Two and a half thousand specimens representing first records have been imaged and databased and are available through our online tools and services.

Katarina Tawiri continues as kaitiaki (guardian) of the National New Zealand Flax collection, providing living plants to marae, other organisations, and members of the public for weaving and establishing pā harakeke (flax gardens). Katarina is also working on a project studying seasonal effects on the extraction of muka (fibre) from *Phormium* leaves.

Murray Dawson (Fig. 4) has been working on citizen science outreach with support from the Unlocking Curious Minds Fund to take a "Winning the War on Weeds"

Fig. 3. Katarina Tawiri demonstrating her weaving method and a product of her skills.

road show around schools. Students collected and added their plant specimens into Allan Herbarium field presses. As a prize, the keenest student from each school, accompanied by their caregiver, visited our research centre at Lincoln. There, they spent two days (8-9th December) learning how to lodge their class plant collections into the Allan Herbarium and about the biocontrol of weeds.

Fig. 4. Above, Murray Dawson inspiring a group of "curious minds"; below, Allan Fife advancing knowledge of NZ mosses.

Allan Fife (Fig. 4) and **Jessica Beaver's** moss flora continues to grow, with 30 fascicles now published online (Web ref.). Upcoming family treatments include Daltoniaceae, Pilotrichaceae, Saulomataceae, and Tetraphidiaceae.

Web ref. *www.nzflora.info/publications.html*

Among other duties, **Mary Korver (herbarium technician)** (Fig. 5a) recently completed the mounting and accessioning of nearly 6000 specimens associated with WR (Bill) Sykes' *Flora of the Cook Islands* with support from **Lois Binnae** (Friend of the Herbarium).

Reference

Sykes WR 2016. *Flora of the Cook Islands*. Kalaheo, Hawai`i, National Tropical Botanical Garden. 973 pp.

Aaron Wilton (Fig. 5d) is currently in Costa Rica attending the annual conference of Biodiversity Information Standards (TDWG), also known as the Taxonomic Databases Working Group. Otherwise Aaron continues his leadership over our Allan Herbarium databases and eflora development, and is also leading plant systematics research at Landcare Research.

Kerry Ford and **Ines Schönberger** recently taught a two day workshop at Otago University training students in herbarium botany and grass identification. In other work Kerry is writing an eflora treatment of the Nymphaeales, whose sole indigenous representative in New Zealand is the enigmatic *Trithuria inconspicua*.

Sue Scheele (National New Zealand Flax collection, ethnobotany) recently travelled to Norfolk Island to observe *Phormium tenax* and collect tissue samples (Fig. 5b). She and Rob

Fig. 5. Anticlockwise from above. Mary Korver; Sue Scheele examining flax on Norfolk Island; enigmatic *Trithuria inconspicua*, the subject of Kerry Ford's work; c, Ilse Breitwieser; d, Aaron Wilton.

Smissen will be using a genome sequencing approach in an attempt to shed further light on the competing hypotheses that the species is indigenous to Norfolk Island, or that it was introduced there from New Zealand by Polynesian seafarers prior to European arrival in 1774.

Ilse Breitwieser (Fig. 5c) is science leader of the Characterising Land Biota portfolio at Landcare Research, which includes the collections of plants, fungi, invertebrates, and bacteria as well as associated databases and research. She is also Director of the Allan Herbarium (CHR). Her main research interests are systematics of New Zealand Compositae, particularly Gnaphalieae, and the development of the electronic Flora of New Zealand.

Rob Smissen and Jessie Prebble

The passing of two leading New Zealand botanists

Coming with the news from Christchurch was that of the loss of two botanists of high standing who continued working to near or past 90.

Neville Moar (1926–2016) was a key figure in New Zealand palynology. He joined Botany Division, DSIR, in 1947 and, apart from his Ph.D. studies at Cambridge in 1961–64, continued in employment at DSIR until 1987 when he was forced to retire. He continued his studies in retirement up until his death. A comprehensive obituary was recently published by Matt McGlone and Janet Wilmhurst.

Henry Connor (1922–2016) began working at Land Care Research in 1940 and rose to be head of the Allan Herbarium before a productive retirement. An obituary is provided on p. 52, where reference is made also to a tribute published by Peter de Lange.

We have lost two links to past eras of New Zealand palynology and plant systematics.

Reference

McGlone M. & J. Wilmhurst (2016). Neville Taylor Moar BSc, MSc, PhD (Cant.), 31 July 1926–1 June 2016. *N. Zeal. J. Bot.* 54: 520-526. *DOI: 10.1080/0028825X.2016.1247883*

Science careers poorly promoted

Bob Hill provided some strong arguments for science careers on the Science Show on December 3rd. To quote just one sentence:

> Until Australian politicians understand and properly promote the exceptional quality of our best scientists and the obvious relevance of careers in science, we will continue to underachieve at a nation.

Look on the web for his full talk.

Web ref. *www.abc.net.au/radionational/programs/scienceshow/science-careers-poorly-promoted/8086982#transcript*

In addition to botanising ...

Now we know what Miguel de Salas aka the Apple Isle Prospector gets up to in his spare time.

Web ref. *www.abc.net.au/news/2015-09-22/striking-gold-apple-isle-prospector-shares-treasure-secrets/6794718*

Ronald Gunn Tasmanian plant catalogue located

Of great interest for those who have ever had to deal with Ronald Campbell Gunn's Tasmanian plant collections is the exciting news of the finding of a copy of Gunn's catalogue of Tasmanian plants in the NSW State Library.

Reference

Hobbins, P., Cave E. & Cave, L. (undated ?2016). Mysterious leaves from the Past. Bray's Museum of Curios. *www.sl.nsw.gov.au/stories/mysterious-leaves-past*

Art Gallery of WA colonial art exhibition

Unfortunately not much longer for the Art Gallery of Western Australia's exhibition of early colonial art – Unknown Land. It finishes at the end of January but you can get a glimpse of what is on display through their and the ABC's websites (Web ref. 1, 2).

Web ref. 1. *www.artgallery.wa.gov.au/exhibitions/unknown-land.asp*

Web ref. 2. *www.abc.net.au/news/2016-09-16/wa-state-art-gallery-explores-early-colonial-perspectives/7852410*

Cuts to *Trove* in Federal budget

Hard to believe that a site that has grown to be so useful so quickly (since 2008) and made so much information available to researchers (Web ref. 1) has had to reduce funding and staff following the 2016 budget (Web ref. 2, 3).

Web references

1. *http://trove.nla.gov.au/*
2. *www.theaha.org.au/fund-trove/*
3. *www.abc.net.au/news/2016-05-05/national-library-trove-project-not-funded-to-add-to-collection/7377634*

VicFlora launched

In September David Cantrill, head of the National Herbarium of Victoria announced the release of phase 2 of VicFlora, the eFlora for Victorian plants. The new version has nearly 10,000 images, identification keys and a range of other functionalities (Web ref.). There has already been a spike in users with traffic to the new site five times greater than traffic to the first version.

Web ref. *https://vicflora.rbg.vic.gov.au/*

Robyn and Bill Barker

Web sites of interest

A rich source of vouchered pictures of world plant families

Kevin Thiele
EuBio Consulting, Perth

Recently I had the pleasure to accompany Chris Davidson and Sharon Christoph from Boise, Idaho, USA, along with Bruce and Joy Gray from Atherton, on a tour of endemic plant families in the south-west of Western Australia. Chris and Sharon have an ambitious and marvellously obsessive project: to photograph representatives of all the world's APG plant families. They have been steadily working their way around the world, visiting over 44 countries and, with help from local botanists and guides, locating plants to photograph. In Western Australia, they were keen to see and photograph (and we were able to find) *Anarthria* and *Lyginia* (Restionaceae formerly Anarthriaceae), *Borya* (Boryaceae), *Byblis* (Byblidaceae), *Cephalotus* (Cephalotaceae), *Gyrostemon* and *Tersonia* (Gyrostemonaceae), *Dasypogon*, *Kingia* and *Calectasia* (Dasypogonaceae), *Ecdeiocolea* (Ecdeiocoleaceae), *Eremosyne* (Saxifragaceae formerly Eremosynaceae), *Macarthuria* (Macarthuriaceae), *Nitraria* (Nitrariaceae), *Spirogardnera*, *Choretrum* and *Leptomeria* (Amphorogynaceae) and *Trithuria* (Hydatellaceae).

Fig. A spiny handful. Chris and Sharon with an echidna.
Ph. K. Thiele

Some of these were not completely new families for Chris and Sharon, having previously been to Tasmania and Queensland, but many were. A few others (e.g. *Anarthria*) were in WA-endemic families when they left Idaho, but with the publication of APG IV mid-flight, were not so when they landed in Perth! Luckily, Chris and Sharon are good-humoured enough to cope with anything that molecular phylogenies can throw at them. A few less families was probably a good thing anyway, as Chris and Sharon have the alarming but charming tradition of opening a bottle of best-available champagne for every new family – I for one had more good

champagne in a fortnight than in most of the rest of my life.

A few families eluded us. Chris and Sharon only pop the champagne when they can photograph a plant in flower or fruit. A toast to Cephalotaceae will thus have to wait till another visit during its autumn flowering period. Then there's the damnably elusive *Emblingia calceoliflora* (Emblingiaceae), which we failed to find despite a good search of recently-burnt limestone areas within its range. If any of you happen across *Emblingia* next spring, please let me know and I believe Chris and Sharon will be on the next flight.

While the trip as described may sound like a bit of a jolly, there is serious intent. If you need to see what almost any family in the world looks like, visit Chris and Sharon's website (Web ref.). This has grown to be a very useful one-stop resource for students, researchers and enthusiasts alike, with nearly 200,000 vouchered photographs of all but a handful of remaining families (note that it will take a few months' hard work to get their most-recent Australian photographs up, but they'll be there soon). Their project is commendable also in that Chris and Sharon try to photograph every aspect of each plant they target, not just the flowers. And, unlike twitchers in some other disciplines, they were keen to photograph good plants in any family we happened across, not just their targets (I discovered this when we ran out of press space on the second day). So – check out the website, and be thankful that the world has room for delightfully obsessive-compulsive botanists.

Web reference

www.floraoftheworld.org/

Australasian botanic gardens

As a result of the move of the State Herbarium of South Australia (AD) back into the fold with the Botanic Gardens with the appointment of Lucy Sutherland as the new director, there has been an increasing Botanic Gardens related information in our emails. For those of you not associated with Botanic Gardens the following websites may well be of interest since they show increasing activity, coordination and professionalism in societies that not so long ago were very much in their infancy in individual gardens.

Botanic Gardens, Australia & New Zealand (BGANZ)

While they are just about to get a new website the BGANZ site can still be accessed (Web ref. 1). As their title suggests, the site gives access to news about Botanic Gardens throughout Australia and New Zealand and also gives access to their newsletter, *THE BOTANIC GARDENer*, the latest of which concentrates on interpretation and communication in gardens as well as trying to define what make a botanic garden. One of the sites also accessible through this page is the new Botanic Gardens Education Network whose purpose is to create a professional development network for Botanic Gardens staff and volunteers allowing them to share ideas and promote further collaborations between Botanic Gardens.

Australian Association of Friends of Botanic Gardens

The title says it all and the website (Web ref. 2) provides access to the activities of those many Botanic Gardens' Friends Societies throughout Australia. Initially formed in many of the major gardens in the late 1970s and 80s these Friends groups have provided an invaluable link between the Botanic Gardens and the plant-loving community, very much to the benefit of both. The evolution of the Friends groups into the multi-facetted societies they are today is quite remarkable and their grouping into an Australian Association will no doubt lead to further advancements. It was the Victorian Friends societies who first formed an association and you can read about their activities from 2000 through their archived newsletter, *Campsis*, on the website. The name of the newsletter was changed to *Eucalyptus* in 2015, to reflect the expansion of the group to include gardens from the whole of Australia, and that too is available on the site.

Web references

1. *www.bganz.org.au/index.php*
2. *www.friendsbotanicgardens.org/*

Robyn Barker

ABRS report

Staff updates

Zoë Knapp started maternity leave a little earlier than expected with the safe arrival of a boy on September 7. Russell Barrett had started with ABRS as a *Flora* editor on a short-term contract on August 23, so a short hand-over from Zoë was possible, though briefer than anticipated. Russell was previously working at the Australian National Herbarium (CANB) following a move to Canberra from Kings Park & Botanic Garden in Perth. Two *Flora* editor roles were advertised in October and an announcement on the successful candidates is expected before Christmas. Herpetologist Alberto Venchi joined ABRS on November 30 on a short-term contract to work on the Australian Faunal Directory.

***Flora of Australia* and an Australasian eFlora platform**

As seen by those attending the ABRS conference in Alice Springs, the Australasian *eFlora* platform is taking real form and while not yet public, now contains real content. Two development sprints by the Atlas of Living Australia, one kicking off as this goes to press, will see most of the bugs ironed out of the system and improved functionality of the platform. All existing hard-copy vascular *Flora* treatments have been digitised and are ready for import to the platform in advance of a public release. Good progress is being made on editing previously unpublished treatments and it is planned that a number of smaller families, along with Euphorbiaceae (*s. str.*) and most genera of Caryophyllaceae will be released at the public launch of the platform. Priorities for remaining treatments already supplied to ABRS are currently being determined. New *Guidelines for Contributors* have been drafted and should be available by January 2017. Further review and tweaking of the *eFlora* platform can be expected in early 2017, with a launch anticipated in the first half of the year. The International Botanical Congress to be held in Shenzhen, China, in July will also include a presentation on the new *eFlora* platform.

***Fungi of Australia* – a new volume**

At nearly 600 pages, the new volume covering Australian Inocybaceae is the largest taxonomic treatment to date in the *Fungi of Australia* series. The volume has been written by Brandon Matheny & Neale Bougher, with contributions from a number of collaborators. Formatting has been completed and the book delivered to CSIRO Publishing, with printing expected in the first half of 2017.

Algae of Australia

ABRS is also working with John Huisman in the preparation of the next *Algae of Australia* volume: Marine Benthic Algae of North Western Australia: Red Algae volume 2. This will likely be published in late 2017.

Grants

Applications for the 2017–18 National Taxonomy Research Grant Programme's Research and Capacity- building grant rounds are currently being assessed. Successful applications will be listed on the ABRS website (Web ref. 1), once announced.

Bush Blitz

Recent expeditions

Two highly successful Bush Blitz expeditions have been undertaken since the last *Newsletter*, and a third is currently underway. The first, to Lake Torrens in South Australia, occurred during August/September 2016 and participants were treated to great fields of wildflowers in an often dry and dusty desert environment. The second expedition targeted Mallacoota Inlet, Gabo Island and the western parts of Croajingalong National Park in Victoria during November 2016. This Croajingalong NP expedition included both terrestrial and marine surveys including collection of marine algae by Melbourne University. Photos from these expeditions can be found on the Bush Blitz website (Web ref. 2). A second expedition to Croajingalong NP is currently underway. This expedition has a purely terrestrial focus and is targeting the wild and remote country near the NSW border, including seldom-surveyed Lake Barracoota and Lake Wau Wauka.

Upcoming planned expeditions

The next planned expedition is a trip to Quinkan country, Cape York Peninsula, in March 2017.

References

Web ref. 1: *www.environment.gov.au/science/abrs*

Web ref. 2: *www.bushblitz.org.au*

Russell Barrett & Anthony Whalen
ABRS
November 2016

Promoting systematics

noto|biotica, a new blog for Australasian biosystematics

Kevin Thiele
EuBio Consulting, Perth

Ever thought of blogging, but…? Have a look at noto|biotica (Web ref. 1), a collaborative community blogging site for the taxonomy and systematics communities in Australasia. Posthaven, the platform that supports noto|biotica, is a very, very simple blogging platform – if you can write an email you can write a blog post (in fact, you can even write a blog post by writing an email – to find out how visit Web ref. 2).

The core idea of noto|biotica is to be a truly collaborative community resource. It occupies a space that I think is currently unoccupied. A few people have personal blogs (Tim Entwisle's Talking plants (Web ref. 3) and Alexander Schmidt-Lebuhn's Phylo-botanist (Web ref. 4) are two good examples). But these are serious bloggers – they keep up a reliable stream of informative, entertaining blogs at a rate that would leave most of us knackered. At the other end of the spectrum are the various Facebook pages in our community (if you haven't already friended the ASBS at Web ref. 5, you should). But Facebook posts are almost invariably short, like comments over your shoulder to someone walking in the opposite direction at a fast pace down a long corridor. Blog posts can be more leisured, like a good conversation over a late lunch. Contribute to noto|biotica and you'll have the opportunity to blog properly, but without the sheer exhaustion of maintaining an ongoing and continuous stream of witty, deeply considered and inspiring gems.

Noto|biotica can be used in a variety of ways. Imagine if we all – every one of us – were to write a short blog-profile of ourselves. Noto|biotica would instantly become a great resource for finding out about someone you've seen as an author on a paper. Imagine if we each wrote a short blog on our current projects – noto|biotica would instantly become an invaluable resource for finding out who's working on what. Then there's the opportunity to simply start a conversation on a topic that interests you, or to be provocative (in the nicest possible way), or to simply throw out a wild idea.

As well as all this, noto|biotica is envisaged as one of the means by which those of us working on the Decadal Plan plan to keep in touch, and expose for comment and discussion ideas and visions as we go along. Being involved with noto|biotica will be one way that you can be engaged with what may become a critical step-change in our discipline.

Becoming part of the noto|biotica community is dead easy. Simply register on the site, or send an email to oztaxregister@gmail.com with the subject "Please register me". You'll receive a response email with instructions on the next steps. You're then ready to use noto|biotica in whatever way you wish, either by contributing blogs, commenting on others' blogs, or simply following the conversation. If you've ever thought of blogging, but have never had the opportunity, try, this may be your chance.

By the way, check out your favourite Greek dictionary (Brown's Composition of Scientific Words is my favourite) to work out the etymology.

Web references

1. *http://notobiotica.posthaven.com/*
2. *http://notobiotica.posthaven.com/so-what-is-noto-biotica*
3. *http://talkingplants.blogspot.com.au/*
4. *http://phylobotanist.blogspot.com.au/*
5. *https://www.facebook.com/groups/434955569922530/*

Atlas of Living Australia report

Collections community coordinator update (aka: ALA CCC FYIs)

Ryonen Butcher
WA Herbarium. Ryonen.Butcher@DPaW.wa.gov.au

For the past year I've been engaged half-time with the Atlas of Living Australia (ALA) as the botanical collections community coordinator (CCC). The position is varied, always interesting, involves more acronyms than it probably should, and can be summarised as follows: to be a communication conduit between the botanical collections community and the ALA; to synthesise, document, report and monitor impediments and problems with the ALA, and communicate progress and resolution back to the community; to provide expert advice to the ALA on collections-specific matters; to participate in meetings between ALA, CHAH and HISCOM; to assist ALA Communications and Education resources in the promotion of ALA and collections work.

For those unaware of the ALA's scope: it's an NCRIS-funded, open data aggregation portal that allows the wealth of biodiversity data contributed by collections institutions, academics, scientists, environmental groups and enthusiasts to be stored, explored and analysed. All our herbarium specimen data and associated multimedia are uploaded to the ALA and are accessible there as well as through AVH, a specialised ALA data hub. The ALA has strong partnerships with other NCRIS facilities, such as ANDS (Australian National Data Service), and its BioCollect tool has been developed to facilitate field data capture and submission into the TERN (Terrestrial Ecological Research Network) AEKOS eco-informatics systems (among others). The ALA is also currently working with BPA (Bioplatforms Australia) on management and visualisation tools for large molecular data sets, and with a number of Aboriginal groups to record and manage Indigenous Ecological Knowledge, sharing that as appropriate through the ALA's BIE-linked seasonal calendars. They are also developing the platform we will be using to produce the eFlora of Australia.

As founding partners of the ALA and valued providers of high-quality and verifiable data, the collections community works collaboratively with the ALA to ensure the data we deliver are accurate, informative and versatile for a range of uses, including ours. The ALA therefore hosted a Biological Collections Community strategic planning workshop (Canberra, Feb. 2016), which was attended by key stakeholders across the collections communities, including the heads of CHAH, CHAFC, CHACM, HISCOM and FCIG, and representatives from GBIF, NRCA and BHL — have fun with those acronyms, this is my world now[1]… Priority areas for discussion were identified pre-meeting, voted for during the workshop, and expanded on by issues champions; the top-ranked priorities are shown in column 1 of Table 1. Traits deserve a special mention because of ongoing interest in how the ALA might develop systems to collect, manage and host large, re-useable data sets, and project manager Michael Hope recently discussed traits databases at the Kings Park and Botanic Gardens seed traits symposium held in Perth in October, 2016) (Web ref. 1).

The ALA operates under an agile sprint model with three sprints occurring at any one time (2 x development, 1 x maintenance). The team is currently under-capacity and they're looking for a Senior Applications Developer and an Operations Manager (the positions are advertised on Seek (Web ref. 2), so please pass that news on to any interested parties). Some sprints and projects are of greater interest to the herbarium community than others and some key, recent developments in AVH and the ALA interface are discussed here.

The new AVH (The Australasian Virtual Herbarium) will soon be released! A test version is up (Web ref. 3) and its use by the community is encouraged in the meantime. If you have any feedback, please let me know. The expanded site includes:

- Specimen data from all the New Zealand herbaria

[1] Ryonen informs us that she has resorted to compiling a seven page table of acronyms, including relevant hyperlinks. *Eds.*

Table 1. Breakdown of votes received per priority issue raised at the ALA Biological Collections Community workshop, Canberra, Feb. 2016.

Issue	Votes	Issue	Votes
Image management	12	Virtual Natural History Museum	4
Digitising our collection	10	Species interactions	4
Names management	9	Field data capture	4
Genomic data delivery	7	Shared virtual taxonomy	4
eMonograph (eFlora) capabilities	5	Foundational infrastructure	4
Handling of duplicates	5	Literature management/links	3
Annotation services*	4	Collection management systems	2
Trait data*	4	+ a 'fix-it' list	

- New indexed fields for filtering records
- Collector number now in the record pop-up window in Map view
- Collection record page enhancements, including a prominent position for the 'supplied vs processed' data link, easier navigation of record data through quick links and linked, traffic-light-style data quality measures, action buttons (e.g. annotations, contacts) aggregated in the top left corner of the page, and institutional details and catalogue numbers emphasised (these features are already live through the ALA)
- Improved annotation services, with the ability to verify records and respond to user assertions
- Increased download functionality, with the previous cap of 500 records removed (now unlimited; downloads spooled and emailed) and downloads available in different formats (full DwC (Darwin Core), ALA legacy, or customisable).

For those tapping their fingers, it appears that its release is currently hampered by name (mis-)matching issues between the ALA and the NZOR (New Zealand Organism Register); ingestion of the full NZVH (New Zealand Virtual Herbarium) dataset has resulted in some 2,100 records (125 names) now asserted to be animals... This is tied to the ALA's name matching process, which attempts to find the accepted name for a record through reference to a hierarchy of different names databases, consulted in the order: AusFungi, AusMoss, AFD, APNI/APC, CAAB, NZOR, CoL (for viruses, bacteria etc. only) and ALA special interest lists. Investigation shows that the mismatched names are not on these (sometimes incomplete) reference lists and either have generic homonyms in the AFD (Australian Faunal Directory) or are novel and have been fuzzy-matched to something extraordinarily different. The ALA recently spent 18 months on their names management system and the majority of persistent issues have been resolved. Further work is evidently required to accommodate the NZOR, and the problem has been logged.

As a data aggregator with close to 68 million records and 474 spatial layers, and as a launch pad for a wide array of projects and analytical tools (including new links between the ALA Sandbox and the BCCVL; Biodiversity Climate Change Virtual Laboratory), the ALA has a lot going on. So much, in fact, that it can be difficult to navigate and use to best effect. Following feedback, a user experience (UX) vendor has been engaged by the ALA to explore the usability of the site and identify blockers to its uptake and exploitation by broad elements of the user community. Prior to the UX workshop (Canberra, Oct. 2016) a test interface for the ALA was developed (Web ref. 4) to assess responses to proposed changes in data organisation. Key changes included:

- Main menu navigation and footer navigation regrouped for better aggregation of information; active language used to reflect the ways the user can engage with the ALA
- Start exploring, Search & analyse, Participate, and Learn about the ALA drop-down menu items replace ALA Apps and ALA Info menus; these menu items are also in the footer
- Homepage Information channels have been reordered and main channels on the homepage (Iconic species, Species by location, etc.) are regrouped to reflect the main menu and footer information architecture
- Information Hub channel included into main channels, and aggregates help page

information in a central location
- A new template has been added for the Information Hub channel, help content pages and help landing pages to separate them visually from existing non-help page content (Web ref. 5).
- Help page information updated, and new content included for other pages (About the Atlas, How we …, How you can …).

These working changes have been well-received, although the continued absence of an Advanced Search link on the homepage (and every other page) is notable. The interface will continue to be developed in conjunction with the UX review, so feedback is welcomed.

To finish, liaising between ALA users in the herbarium community and ALA developers to define and resolve issues in the delivery and retrieval of specimen and taxon data is a major part of my role as CCC, and it's very satisfying to nut out a problem, see a fix implemented and make a botanist smile. Please don't hesitate to contact me with any ALA-related queries or frustrations – I'll see what I can do.

Web references

1. *www.bgpa.wa.gov.au/images/pdf/kings_park/is_seed_traits_symposium_program_03102016.pdf*
2. *https://www.seek.com.au*
3. *http://avh-test.ala.org.au*
4. *https://wptest2016.ala.org.au/*
5. *https://wptest.ala.org.au/atlas-information-hub/*

Miscellanea

Reminiscences of Bob Thorne (1920–2015) and a visit to Lord Howe Island in 1981

Rudolf Schmid
Department of Integrative Biology, University of California,
Berkeley, California 94720-3140, USA (*schmid@berkeley.edu*)

[1]Bob Thorne (born 13 July 1920 in Spring Lake, New Jersey; died 24 Mar. 2015 in Claremont, California at age 94.7) loved island floras, undoubtedly due to their high rates of endemism, which generally meant, for Bob, interesting new taxa. For instance, the combined vascular plant flora of Norfolk and Lord Howe Islands, both in the Tasman Sea, comprises 136 families, 455 genera (7 endemic), and 706 species and infraspecific taxa (345 native, 149 endemic, 361 alien). The XIII International Botanical Congress held in Sydney in August 1981 allowed Bob to indulge in his passion. There were two field trips to Lord Howe Island: #17/1 (17–21 Aug. 1981) and #17/2 (29 Aug.–2 Sep. 1981). Bob and I thought it would be more relaxing to take the four-day post-congress field trip.

In *Taxon* 59: 1629–1630 (Oct. 2010) I reviewed several volumes of Algae of Australia and Fungi of Australia and ended thusly:

> Postscript: I have fond memories of Lord Howe Island, having attended the field trip there after the ... Congress: sharing a motel and collecting with Bob Thorne, a runner's high during a 10-km run about the island, a climber's high on Mt. Gower (875 m), gorgeous scenery to photograph, etc. It was the perfect antidote to my prior 'incarceration' in the dreary, Orwellian People's Palace[2] (1888–1988) during the congress. Confession: I fingered one of their towels and used it as a bath foot mat til it wore out.

I justified this petty theft as appropriate compensation for the incessant hotel loudspeaker announcements that prevented one from sleeping in and recovering from jet lag.

Tony Rodd (1981) wrote an excellent 42-page guide for the field trips to Lord Howe Island. I spent days looking for my copy and finally desperate for assurance that the handbook was not a figment of my memory checked the excellent online catalog of the Mertz Library of the New York Botanical Garden. Sure enough, that is where my copy now resides. Incidentally, the full vascular-plant flora of Lord Howe Island and Norfolk Island appeared

[1] This account is extracted from a very much longer one, "Reminisces of Robert Fulford 'Bob' Thorne (1920–2015)', which still awaits completion.

[2] The People's Palace was run by the Salvation Army at 508 Pitt St, Sydney. See *http://sydneyarchitecture.com/GON/GON152.htm*

in the Flora of Australia as volume 49 (1994) and was mostly written by Peter Green.

Bob and I were motel mates and together collected 110 numbers of herbarium specimens, including many pickles. The bathroom in the motel served as a staging area for the collections. We found the bidet handy to wash soil off roots and rhizomes of pteridophytes and monocotyledons.

I shot seven rolls of Kodachrome 25, including on 31 August 1981 the photo of Bob (age 61) sitting on a motel bed pressing plants and examining the endemic *Atractocarpus stipularis* (Rubiaceae) (Fig.). I am greatly indebted to Alex George for providing the identification. He emailed (30 Jan. 2016):

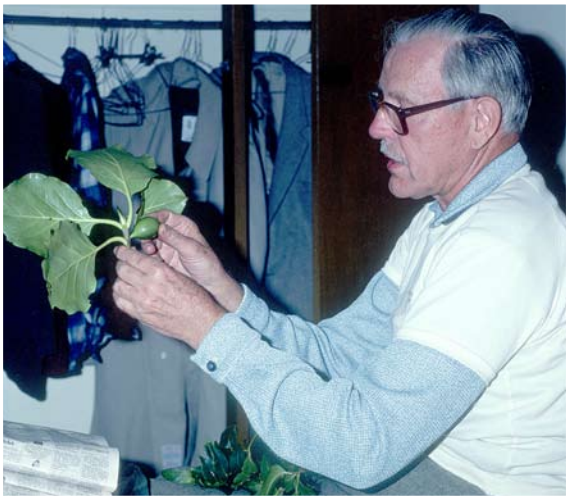
> I'm pretty sure that the specimen that Bob Thorne is holding is *Atractocarpus stipularis*, commonly called Green Plum. It's a tree to 12 m tall, dioecious, endemic on Lord Howe Island, 'widespread in sheltered spots at all altitudes' (*Fl. Australia* 49: 352, 1994 [see also Fig. 87F, p. 356]). I think that the linear structure at the apex of the stem is a stipule—these are connate or interlocking and soon fall.

Henk Beentje (pers. comm., 23 Mar. 2016) reported that Seth Menser from the San Diego Zoo(!) also provided this identification.

Reference

Rodd A.N. (1981) *Field trip 17 Lord Howe Island Handbook.* (XIII Int. Bot. Congr. Sydney).

Fig. Bob Thorne with his Norfolk Island endemic. Ph. R. Schmid



Grants

Citizen science project grants

New government grants have become available to science researchers for Citizen Science projects.

The Minister for Industry, Innovation and Science, the Hon Greg Hunt, has announced the opening of the Citizen Science Grants element of the Inspiring Australia – Science Engagement Programme, part of the Australian Government's National Innovation Science Agenda. The government is providing $4 million over the next four years to promote collaboration between Australia's best scientists and the public.

Who can apply, and how

Grants of between $50 000 and $500 000 will be awarded to eligible Australian researchers for significant research projects that directly involve the public through a range of activities – for example, collecting and analysing data, formulating research questions and organising research teams.

Eligible projects must:

- run for a maximum of three years,
- be peer-reviewed, and
- produce credible, reliable data that will be shared with participants, the science community and the public.

Examples of successful citizen science projects include Wildlife Spotter, an online project to identify wildlife in 2.6 million images from across Australia, and the Fireballs in the Sky project, which to date has educated more than 24 000 people in 88 countries around the world to learn about fireball and meteorite science, and to contribute sightings using a smartphone app.

Grant applications will close on 17 February 2017. For more information and to apply, visit the website (Web ref.).

Web reference. *www.business.gov.au/csg*

Obituaries

Henry E. Connor CNZM, MSc (Hons), DSc, FRSNZ
4 August 1922 – 26 July 2016

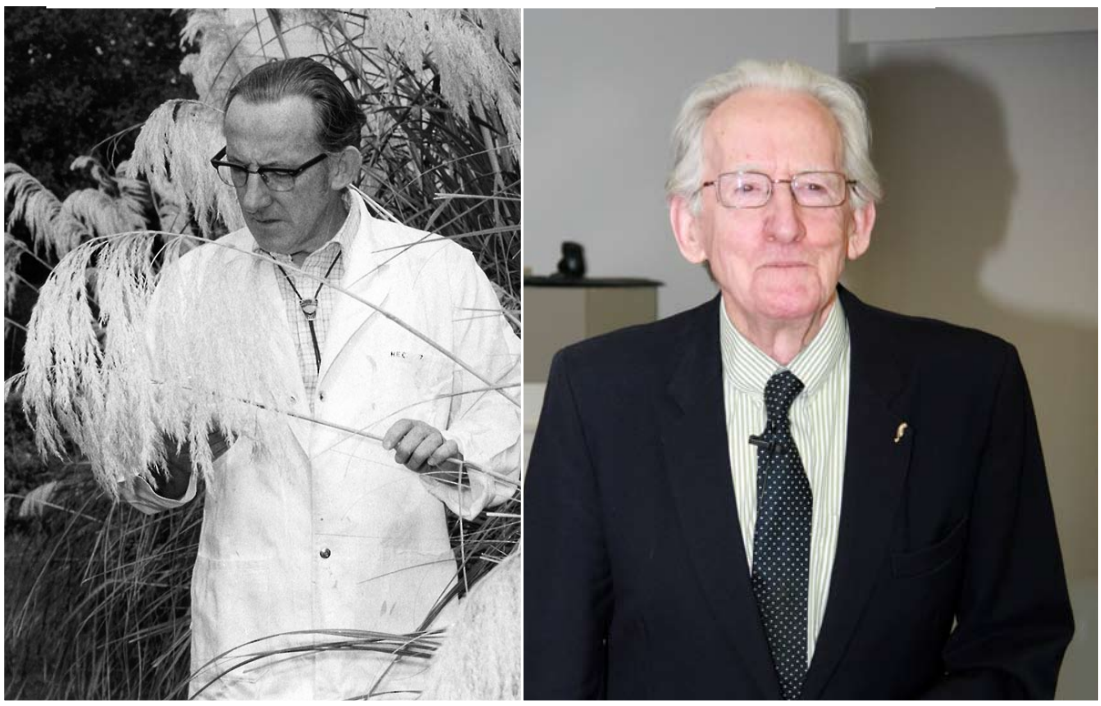
Ilse Breitwieser and Kerry Ford
Allan Herbarium, Landcare Research, Lincoln

Dr Henry Connor, one of the leading agrostologists of the 20th century, passed away on 26 July 2016, just a week before his 94th birthday. Henry's research spanned taxonomy, genetics, ecology, and reproductive biology of grasses, although he did venture into other plant families on occasions. He was Director of Botany Division DSIR, Landcare Research's predecessor organisation, from 1980 – 1982.

Henry used to highlight two points from his school and university time in Wellington: at St Patrick's College he learned that scholarship existed, and Dr Newman at Victoria University College gave him a proper foundation in Botany. Henry joined Botany Division in 1940. He completed his BSc as a part-time student in 1948 and his MSc 1st Class Honours in 1950, both from Victoria University. In 1974, he became Assistant-Director of Botany Division, and head of the Taxonomy Section. In 1978 he was awarded a Doctor of Science from University of Canterbury. From 1980 - 1982 he was Director of Botany Division. Although this was only a relatively short time, he proved to be an able manager during a time of constrained resources. Botany Division staff remember him as a hard task-master, and they appreciated him for his intellect of the sharpest kind, his absolute love of science, and his dry humour. Henry retired in 1982 after 40 years of service. In his retirement he took residence at the University of Canterbury, first at the Centre for Resource Management, and later at Geography department.

Henry is best known internationally for his publications on the reproductive biology of grasses. For example, together with David Penny, he reported in 1960 for the first time the occurrence of gynodioecism in the grass family; and this led him to even more discoveries of their reproductive biology. His survey of the breeding systems of grasses of the world was

Fig. Henry Connor, at left with *Austroderia* (*Cortaderia*) in earlier days, and at right, at his 90th birthday celebration. Ph. DSIR



the milestone from which any further work on grasses worldwide proceeded.

The study of the reproductive systems of grasses expanded into experimental taxonomy and studies of hybridisation, and then from the studies of the growth and development of tussock grasses to the ecology of the grasslands, and then to chemotaxonomy and formal taxonomy, the synthesis of all of his previous work.

The culmination of his work was Dr Elizabeth Edgar's and his Volume 5 of "Flora of New Zealand", dealing with New Zealand's 460 species of native and introduced grasses. The Flora was published in 2000 and the second edition 10 years later.

However, Henry's work provided also valuable contributions to other fields. Early in his career he began compiling information about plants that endangered livestock. He became the authority on plants that poison in New Zealand. He published his first poisonous plants book in 1951, a much expanded version in 1977, and one, together with John Fountain, in 2009.

Henry served on many professional committees and boards, including the North Canterbury Nassella Tussock Board and the Mt Cook National Park Board.

Henry had interests outside of work one being his passions for wine. He was a long serving member of the Christchurch Wine and food Society and its cellarmaster for many years.

Henry's career exemplifies the DSIR and CRI tradition of public good science. But even more importantly, it also exemplifies "good" science and scholarship. In 1983, he was elected Fellow of the Royal Society of New Zealand, and in 2000 he was awarded, along with Elizabeth Edgar, the prestigious Hutton Medal for contributions to the documentation and botanical classification of the New Zealand flora. He was appointed a Companion of the New Zealand Order of Merit in 2002 for services to botany.

Henry was tirelessly curious and inspirationally productive, publishing over 160 papers and 8 books, and, remarkably, roughly half of his publications were written or completed post-retirement (Web ref. 1).

Web reference

Breitwieser I & K. Ford (2016). Publications of Henry E. Connor. *On-line addendum to Austral. Syst. Bot. Soc. Newsletter* 168-9 (Dec 2016). [To be published on ASBS web site]

Editorial notes

***Henry Connor: ASBS Burbidge Lecture*r**

Alex George reminds us that Henry Connor gave the Society's 1985 Burbidge Lecture (Connor 1985).

A personal tribute by Peter de Lange

We refer the reader to Peter de Lange's (2016) personal tribute to Henry Connor in *Trilepidea,* the newsletter of the New Zealand Plant Conservation Network. It brings out the extraordinary personality of a man of substance and influence in New Zealand botany.

References

Connor, H.E.(1985). The effect of Australian dicotyledons on the taxonomy of the angiosperms. *Austral. Syst. Bot. Soc. Newsletter* 43: 1--15.

Lange, P.J. de (2016). *Aequi iniqui* Henry E. Connor CNZM, MSc (Hons), DSc, FRSNZ - man of science (4 August 1922 - 26 July 2016). *Trilepidea* 153: 1-7. *www.nzpcn.org.nz/publications/Trilepidea-153-160828.pdf*

Australasian Systematic Botany Society Inc.

2017 Membership Fees

These are due on January 1st each year.

Subscription rates:

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This is also an opportunity to donate to the Research Fund.

***Prospective Members* need to download a membership form from the membership section of the ASBS web site.**

Please direct enquiries to Treasurer John Clarkson.

Dr M.I.H. (Ian) Brooker AM
2nd June 1934 – 25th June 2016

Stephen Hopper
The University of Western Australia,
Foreshore House, Proudlove Parade, Albany 6330, Western Australia

With the passing of Ian Brooker after a short illness, we have lost one of the giants in the field of eucalypt systematics and morphology. For most of his career, Ian uniquely held positions focussed entirely on researching the eucalypts. No one before or since has had that opportunity.

Ian's work ethic and generous mentoring rewarded those who appointed him or had the pleasure of working with him. His legacy of diligence and collaboration is evident in the long list of eucalypts now bearing his name as sole author (30 species and subspecies: see Barker, p. 65, Table 1) or co-author (176), his prodigious publications of taxonomic papers and books; in the naming of Brooker's gum (*Eucalyptus brookeriana* A.M.Gray) in 1979 (Fig. 1); in the awarding of a DSc by ANU in 2000; and in the ultimate honour accorded by his nation in being awarded a Member of the Order of Australia (AM) in 2006.

Fig. 1. *Eucalyptus brookeriana*, an endemic of Tasmania and adjacent southern Victoria, here seen with resplendent colourful bark in eastern Tasmania in March 1984. Ph. SD Hopper.

Intensely private as a young person, Ian became more outgoing in adult life, although he never married and drew great inspiration and solace from his work and passions for things European and religious. He has been described as eccentric in one recent obituary (Anon. 2016). Perhaps he was, on superficial examination, but no more so than most alpha taxonomists I would venture. The discipline, founded on Hookerian intellectual traditions of herbarium-based intuited taxonomic species concepts, requires of many of its traditional exponents an ability to internalize masses of information, posit a taxonomy, submit it to peer review, and wait with trepidation to see what the next generation of alpha taxonomists might do with their classificatory progeny. Such work requires a degree of idiosyncracy and self-belief that to some may be summarised as eccentric. Ian was of this mould, thoroughly. His individuality shone through, such that he was affectionately known as 'The Brooker' to myself and close colleagues in Western Australia. There was no other.

There are aspects of Ian's life about which I knew very little until reading recent obituaries: his birth on June 2 1934 and early life as son of Flossie and Murray Brooker and brother to Alison, Audrey and Rosalie; his education at East Adelaide Primary School and St Peter's College on a full academic scholarship; his graduation from the University of Adelaide with a bachelor of agricultural science; his early work in the soil conservation branch of the Department of Agriculture in South Australia from 1957 to 1963; his 1966 MSc on eucalypt developmental morphology completed in the Department of Botany at ANU; his wide solo

travels to many European countries, the USA, Brazil, southern and eastern Africa, Morocco, Israel, India, China, and New Zealand; and his later life in Canberra after the halcyon days in the 1980s and 1990s of our Western Australian collaboration ceased.

There are intriguing mentions of personal memoirs detailing him

> being interrogated for hours by KGB officers in Siberia, to discovering the sublime beauty of orthodoxy in Sofia, Bulgaria, to complaining about blowflies found in a salad roll purchased at the WACA (Anon. 2016).

I was aware of his passion for collecting and seeing religious icons, and for watching cricket. He was rarely forthcoming on countless nights around the campfire and socially in Perth about his other life as a solo traveller. We had more than enough material for prolonged discussions about the eucalypts seen and newly discovered or better understood from each day in the bush. A little gossip on intriguing personalities known to both of us also enlivened conversations in the crackling firelight.

Ian and I collaborated at a time when my wife Chris and I were raising a young family. Our eldest son Luke as a toddler was intrigued by Ian's aloofness, and followed him around like a puppy despite the disinterest shown by The Brooker. Secretly, I think Ian enjoyed this attention. He was kind even if seemingly off-hand to our first born. Such kindness to others is mentioned in companion obituaries (Anon. 2016).

Publications

Ian's publishing career began in 1960 with two articles in the *South Australian Journal of Agriculture*: "Organic matter – key to good soil" and the prosaic "Soils of the lower River Murray swamps". His first publication on eucalypts was in 1968 in the *Australian Journal of Botany*, based on a 1966 MSc thesis at ANU, on phyllotaxis in *E. socialis* and *E. oleosa*. This was followed in 1970 in the same journal with an inaugural taxonomic contribution on seedling morphology and classification in a group of eucalypts (*Bisectae*). In 1971 his only biological survey publication (Flora of the Millstream area in the Hamersley Range) appeared, based on work in 1970 during a year in the employ of the Western Australian Herbarium.

Formal taxonomic descriptions of new eucalypts commenced in 1972 with the publication of *E. pendens* and three other taxa in the journal *Nuytsia*. By this time Ian had moved back to Canberra as an employee of the Forestry and Timber Bureau, which ultimately morphed and merged into CSIRO's Division of Forestry. His first book, co-authored in 1980 with Doug Boland and John Turnbull, was the still useful *Eucalyptus Seed*. Many more taxonomic descriptions followed, and the three volume *Field Guide to Eucalypts* was published privately with David Kleinig between 1983 and 2006.

At Judy West's behest, from 1996 to 2002 while working/volunteering at the Australian National Herbarium within CSIRO's Plant Industry, Ian led the development of the online taxonomic database EUCLID. First published in 1997 as *EUCLID Eucalypts of South-eastern Australia*, this was updated and extended in 2002 as *EUCLID Eucalypts of Southern Australia* on 2 CDs, treating 690 species and subspecies of *Eucalyptus* and *Angophora*. The updated project again appeared in 2006 on DVD as *EUCLID Eucalypts of Australia*, treating 894 species and subspecies of *Eucalyptus, Corymbia* and *Angophora*.

Ian had retired, however, in 1999, which he wrote to me was 'quite welcome as I do not have to disappear and I retain all my rights and priviledges [sic] in the Organisation, apart from salary'. His work was his life, and to 'disappear' (being made redundant and unwelcome to carry on research) would have been a bitter pill to swallow indeed had circumstances turned out differently. That he had more to offer was evident in arguably Ian's most valuable contribution, the formative front-end of his DSc, published in 2000 in *Australian Systematic Botany* as 'A new classification of the genus *Eucalyptus'*. In that paper he provided, for the first time since Blakely (1934) a novel formal classification of eucalypts [Pryor and Johnson's (1971) ground-breaking work was informal], with all taxa given adequate diagnostic description to enable botanists to confidently place species in a comprehensive higher classification. The paper remains a *magnum opus*, without peer for its

scholarly foundation at lower levels in eucalypt classification.

At higher levels, Ian notably sank *Angophora* into *Eucalyptus*, to avoid having to recognise the disputed *Corymbia*, but left the New Caledonian monotypic *Arillastrum* as a genus, rendering his concept of *Eucalyptus* controversial in light of contemporary DNA-based phylogenetics. Regarding the latter methodology, he explained to me (in litt. 22nd October 1999) that his position ('philosophy') was "that all techniques and methods fall ultimately into their due place and are replaced by others. All the latest get the financial support. There is no new thing under the sun as far as I am concerned." With a career devoted to understanding eucalypt classification and discovery of new species from a morphological and field survey perspective, Ian was reluctant to throw all his eggs in the DNA phylogenetics basket. He consistently argued for the need to understand eucalypts using traditional approaches in the field, glasshouse and herbarium, and was a little jaded by this time about the way competitive funding followed fashionable new techniques at the expense of traditional techniques in taxonomy.

However, consistently diplomatic, Ian managed to stay in professional contact and on friendly terms with the two famously clashing research teams of his early days, led by Lawrie Johnson from the Royal Botanic Gardens Sydney, and Denis and Maisie Carr at the Australian National University. A photo of Ian in the field seated on a log at Wongan Hills with Lawrie Johnson and Don Blaxell in the middle (Fig. 2) says it all. Ian is diligently filling in his collection notebook, Lawrie examining a eucalypt, and Don is contemplating the intervening mass of severed eucalypt specimens.

The Brooker steered clear from theoretical debate, both in person and in the literature, perhaps most emphatically in not commenting further in print when his 2000 classification of the eucalypts was challenged in the same year and journal by molecular phylogeneticists Pauline Ladiges and Frank Udovicic. Ian's work was out of step with some contemporary views on higher classification, but remains unreplicated with its scholarly foundation at lower levels in eucalypt classification.

As it happens, Ian's reticence to accept *Corymbia* as a genus may still have merit (Fig. 3). He remained unconvinced of a close relationship between the true bloodwoods and the ghost gums, and their relationships with *Angophora* (Brooker 2000). Erected in 1995 by Ken Hill and Lawrie Johnson, the latest molecular phylogenetics data using whole chloroplast genomes (Bayly 2016) indicates that *Corymbia* is paraphyletic, with the ghost gums (*C.* subg. *Blakella*) more closely related to *Angophora* than to the red bloodwoods (*C.*

Fig. 2. Ian Brooker in the field seated on a log at Wongan Hills, WA, with Lawrie Johnson (right) and Don Blaxell in the middle. Ph. SD Hopper.

Fig. 3. Ian Brooker collecting *Corymbia haemotoxylon* east of Mt Michaud in what is today's Lesueur National Park, WA September 1982. He held doubts about the validity of *Corymbia* after the genus was first described in 1995.

subg. *Corymbia*).

Ian's last publication was a book on leaf venation in eucalypts (Brooker and Nicolle 2013), drawing on a project which he and I initiated together in the first half of 1983 on collaborative field trips in Western Australia.

A Western Australian collaboration

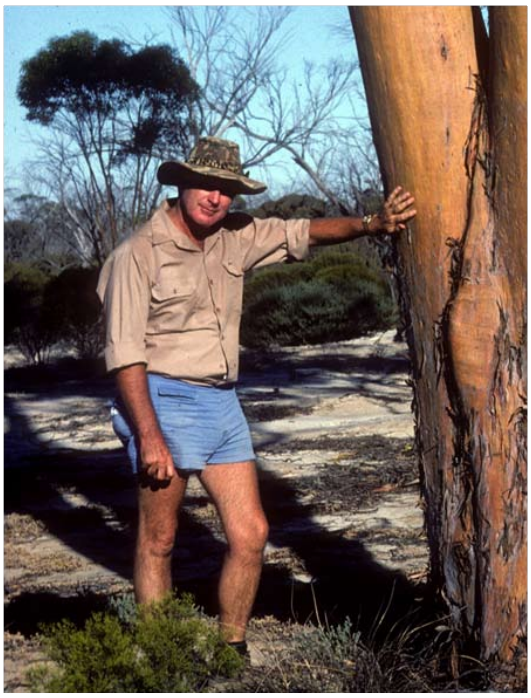
I first made contact with Ian in 1979. As a newly appointed flora conservation research scientist with the Western Australian Department of Fisheries and Wildlife, I was responsible for recommending inaugural lists for consideration as Declared Rare Flora under new conservation legislation. Being grounded in plant evolutionary studies of Haemodoraceae and orchids, I resolved to broaden my understanding of the WA flora by working also at the top of the canopy. Eucalypts were a natural choice. In initial research on what today is known as *Eucalyptus x carnabyi* (*E. drummondii* x *macrocarpa*), I made my first collections in the field of associated eucalypts and went to the available field guide (Chippendale 1973) only to discover that half the eucalypts in hand didn't seem to match the descriptions and photos offered. I wrote to George Chippendale at the Forestry and Timber Bureau in Canberra seeking help. He advised that he had limited field experience in Western Australia, but there was a younger taxonomist down the corridor, Ian Brooker, who had worked at the Western Australian Herbarium in 1969-70, and was a better prospect for solving the identification problems I had raised.

Writing to Ian, he immediately requested specimens, and responded with identifications just as quickly on receipt of the same, inviting me to send him material at any time. By then I had started work on the conservation status of a geographical race of *Eucalyptus caesia* (subsp. *magna*) known in the nursery trade as Silver Princess, and mentioned that I considered it to be a good subspecies (I and others still do [e.g. Brooker and Nicolle 2013], with minor changes to the original circumscription,

despite the curatorial view held by the Western Australian Herbarium). Moreover I had encountered another granite rock endemic eucalypt often found with *E. caesia* subsp. *magna* that appeared to be a new taxon. Ian resolved to travel west to see for himself what I had discovered. We met on August 24 1979 in the field at Chiddarcooping Nature Reserve where subsp. *magna* grew, and a significant taxonomic partnership began (Figs 4, 5, 6), with our first paper together describing new subspecies in *E. caesia* and *E. crucis* published subsequently (Brooker and Hopper 1982), and our last together some two decades later (Brooker and Hopper 2002).

The working basis of our ongoing collaboration was established in that first paper. As senior author, Ian revelled in being on top of the historical eucalypt literature and had by then a masterful understanding of most type specimens of eucalypts, recently culminated when he was Australian Botanical Liaison Officer at Kew in 1980-81. His *modus operandi* also included an essential requirement to personally see mature plants in the field and collect material of every taxon he named or co-named. This necessity

Fig. 4. Ian Brooker leans on a large specimen of salt salmon gum (*Eucalyptus salicola* south of Beacon, WA January 1984. Ph. SD Hopper.



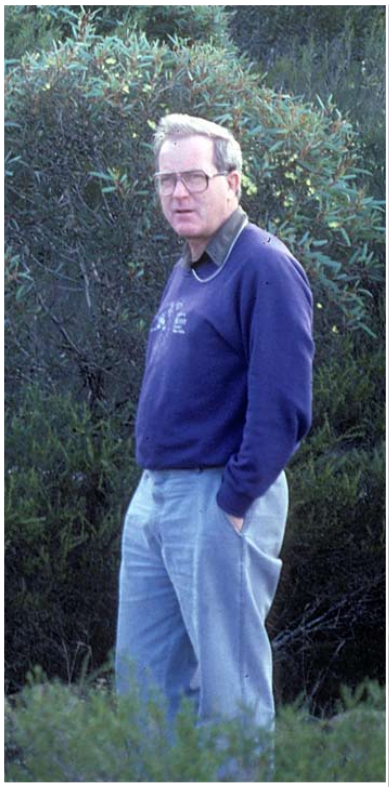
to consider and describe field characters dates back to Mueller's (1858) botanical report on the 1856 North Australia Exploring Expedition. The majority of experienced eucalyptologists see the merit in field studies and careful documentation of field characters, while some herbarium botanists right through to the present day, in typical Hookerian mode, still advocate that if you can't recognise eucalypt taxa from herbarium sheets, they aren't good taxa.

In the field, Ian worked at a pace resembling the outpourings of a woodchipper (Figs 4, 5), with rejected fragments flying off his secateurs at the vehicle. He routinely collected triplicates, sometimes more for future types, and always made a sizable seed collection which subsequently went into the CSIRO seed bank and enabled comparative glasshouse studies of seedling morphology for taxonomic descriptions. Field trips with him were always focussed solely on eucalypts, with no time for stops to take in the scenery or collect other things.

Ian was less interested in taxonomic theory, in ecological relationships other than listing associated eucalypt species seen in the field, or in precise geographical locations (at least in pre-GPS days up to the early 1990s). Hybrids he often referred to as 'freaks', and would rarely bother collecting them, occasionally noting their existence for herbarium labels.

My role as junior partner and co-author focussed on these latter areas of Ian's relative disinterest. I brought to the partnership a strong emphasis on biological or Darwinian species' concepts, as advocated by Pryor and Johnson (1971) and others. As a young conservation biologist, I was interested in ecological, population and reproductive relationships of eucalypts in the field, and contributed such details to our taxonomic papers. Hybrids were a key focus for me through postgraduate research at the University of Western Australia, and also as I realized that hybrids were poorly researched by most herbarium-based taxonomists operating from Hookerian intellectual traditions as Ian had been so thoroughly schooled in.

I shared with Ian a growing interest in taxonomic history and the need to be crystal-clear about types, as well as a passion for critical field studies and exploration of the



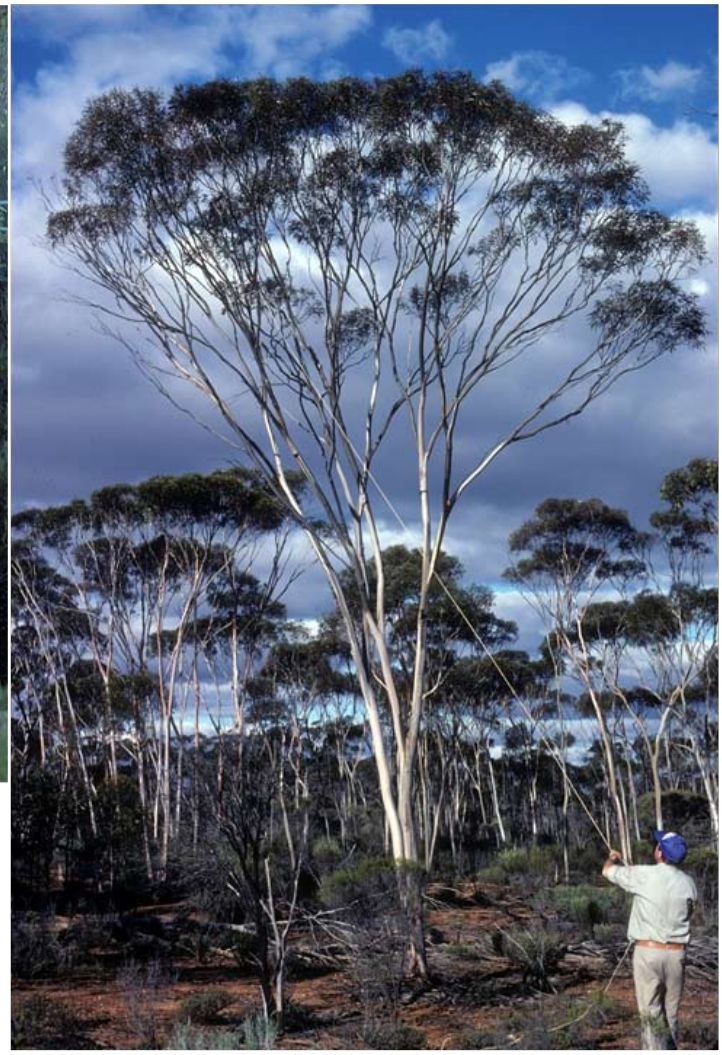


Fig. 5. Left, Ian Brooker in pensive mood northwest of Ravensthorpe, WA July 1987. Right, Ian Brooker collecting specimens of *Eucalyptus spreta* with rope and lead weight, which he deftly mastered without major incident over his career. Northwest of Norseman, WA November 1981.

Ph. SD Hopper.

last remaining great hotspot for poorly studied eucalypts – the Southwest Australian Floristic Region and adjacent Southwest Interzone (today colloquially referred to as the Great Western Woodlands).

Given our disparate perspectives, our collaboration might have led to serious clashes in intellectual debate and disagreement. Yet the joint work on eucalypts ended more with our careers parting amicably in different directions, drifting eventually to occasional chatty emails as the well of agreed new taxa we had worked on together dried up.

Ian was not one for heated discussion or interpersonal conflict. He tolerated my youthful enthusiasms for natural history in general and understanding the field biology of eucalypts from an evolutionary and conservation perspective in particular, becoming annoyed only once after months of collaborative field work over more than a decade. I had delayed departure from our camp in June 1987 in the Great Victoria Desert for a couple of hours and admitted to collecting mosses for a colleague. This was sacrilege at the alter of eucalyptology, and I was chided gently by the words 'We need to move on Steve – there are eucalypts waiting.'

Ian's tolerance for such non-eucalyptoid excesses by the junior member of the partnership stemmed from viewing collaboration and mentoring as essential components of his role. He wanted to ensure as many people as possible were trained in the art of eucalypt identification

Fig. 6. Ian Brooker in the halcyon days of the collaboration on Western Australian eucalypt taxonomy. Here he was collecting *Eucalyptus* x *missilis* (*E. angulosa* x *cornuta*) at Hood Point, Doubtful Island Bay in March 1988.
Ph. SD Hopper.

and taxonomy as part of his legacy.

Ian indulged my theoretical interests in our largest collaborative work (a revision of *Eucalyptus* series *Levispermae* – Brooker and Hopper 1991) by agreeing to include my accounts of taxonomic concepts adopted, and my describing natural hybrid diversity more comprehensively than any previously published eucalypt study. He further agreed to a few of my specimens to be used as types for new taxa, the ultimate badge of recognition as a fully inducted member of Brookerian mentees.

Legendary field work – the search for *Eucalyptus rameliana*

Ian's legendary commitment to eucalypt field work was exemplified by trips associated with false alarms and the ultimate rediscovery of the only species presumed to be extinct – *E. rameliana* (Hopper 1992; Sampson et al. 1995). Collected by explorer Ernest Giles in 1876 at a tantalizing location in the Gibson Desert ('beyond the Alfred and Marie Range') in east-central Western Australia, many fruitless searches occurred towards this locality, inaccessible by vehicle tracks, in the 1980s. In May of 1991, the teenage eucalypt enthusiast Dean Nicolle and his family, owners of the nursery 'Valley Orchids' in South Australia, achieved some publicity over their expeditions. On a preliminary search for *E. rameliana* in 1990, they proceeded overland across trackless country from the Gary Highway east to the western side and then north end of the Alfred and Marie Range. No *E. rameliana* was found, so a more enterprising venture was planned. For this, they invited Ian Brooker and seed collector David Kleinig, who were planning a long trip through central Australia to the Pilbara gathering photos for the third and final volume of their *Field Guide to Eucalypts*.

In April 1991, the party followed the Nicolles' previous wheel tracks to the north end of the Range. The next morning Bob Nicolle and Dean then walked for four days 80 km west from the north end of the Range along Giles' 1876 path, while Maureen Nicolle and her other son Paul drove back to the Gary Highway to wait and pick them up. Ian and David Kleinig spent the day exploring the northern end of the Range, encountering vehicle tracks of another fruitless expedition (by WA Conservation and Land

Management staff in 1988), and seeing only a single eucalypt tree – appropriately, a ghost gum. Ian aptly summarised the day in terms familiar to all Australian desert travellers "the weather was perfect, the conditions extremely dry and the flies absolutely unbearable". He and David left empty handed for the Pilbara the next morning.

Meanwhile, Bob and Dean Nicolle encountered two smooth-fruited plants in a population of *E. kingsmillii* about 30 km east of the Gary Highway, and believed that at last they'd found Giles' mallee. They also found another mallee with smooth fruits and long, sharply pointed buds on slender stalks that didn't match anything seen or recorded before in the eucalypt literature.

On returning to Adelaide and sending specimens to Ian, a third expedition was mounted immediately. Six days after returning to Canberra from a long two week trip across arid Australia, Brooker was again in the Gibson Desert with the Nicolles. They drove to the Gary Highway pick-up point, and then drove across trackless terrain east to the interesting mallees. The party was disappointed not to find any more plants than the two picked up on the foot traverse, despite criss-crossing Giles' path many times over a 10 km by 10 km square, and reaching and ascending the famous McPherson's Pillar (c. 40 km NW of the Alfred and Marie Range). Thousands of *E. kingsmillii* were seen during the search, but no plants were found matching Giles' single-flowered specimen of *E. rameliana*.

In June 1991, I visited Ian at his Herbarium office in Canberra and we were able to examine Giles' original collection of *E. rameliana* (on loan from MEL) alongside one of Dean Nicolle's collections from his hike to the Gary Highway. Subsequently, I was sent fruits of the other plants which Dean wondered might be *E. rameliana*. In both cases, the recent specimens did not match Giles' collection in significant respects, most noticeably in having fruits all in threes and much smaller than would be expected for a plant with buds 2cm in diameter, and in having narrower leaves. Dean's collections most probably were the first ever of a rare hybrid of *E. kingsmilli* and *E. leptopoda* (the plant with sharply pointed buds) and of a poorly known Gibson Desert relative of *E. oxymitra* or *E. oldfieldii*.

Ultimately, in 1991, a genuine rediscovery was made by bushman/seed collector Nick Foote, 500 km beyond the Alfred and Marie Range in the Little Sandy Desert. Ian was at the spot within less than six months, wanting to confirm my identifications made of the Foote collections and my subsequent field observations, as well as secure his own photographs.

Ian then mentored Dean Nicolle more seriously from 1993, and they collaborated on several projects, including the book on leaf venation in eucalypts (Brooker and Nicolle 2013). Dean, too, was accorded the ultimate accolade by Ian, being invited to collect near the Nicolle's now famous Currency Creek Arboretum in South Australia the neotype of *E. camaldulensis*, Australia's most widespread species (MacDonald et al. 2009).

Last but not least – revising river red gums

The revision of *E. camaldulensis* and recognition of six subspecies was Ian's last major collaborative study in formal taxonomy, with all the hallmarks of his mastery of a lifelong career working on eucalypts (Brooker and Orchard 2008; MacDonald et al. 2009). In many ways, it parallels Bruce Maslin's revision of the mulga acacias (Maslin and Reid 2012). I recall warmly the friendly banter between Ian, Bruce and myself in the 1980s and 1990s around the Western Australian Herbarium tea table over which group was more important, eucalypts or acacias. On reflection, these were historic times, being in the presence of Australia's greatest alpha taxonomic exponents of the nation's two largest genera, each of whom had been employed for long and productive careers as taxonomic specialists on their respective plants. Will we ever see the like again?

In June 2016, I learnt about Ian's passing a couple of weeks after submitting my first book on eucalypts for publication. An account of Aboriginal and science perspectives, the book would not have been possible without the mentoring and kick-start in understanding eucalypts that Ian gave to me. The timing of these events, past and recent, almost suggests that my elder friend and colleague

hung on to see that his enthusiasm for serious eucalyptology is being perpetuated. I hope that, in spirit, he will be pleased with the result. The book is dedicated to his memory.

I will miss Ian's generosity of spirit, good humour, and passion for his work (Fig. 6) and other interests. He contributed extensively to knowledge of Australia's most iconic trees. These contributions will be long remembered by all involved with eucalypts.

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Ian Brooker – eucalypt icon

Dean Nicolle

Our first encounter

You never know who you are going to meet in the rough outback town of Coober Pedy, best known for its people living, or prematurely ending up in, holes in the ground. Indeed, Coober Pedy may be one of the last places Ian Brooker would choose to be, considering his penchant for the finer things in life, especially in art, wine and language, and his holiday destination of choice – the Greek Isles. It also doesn't help that the vast plains around Coober Pedy are one of the few expansive regions in Australia devoid of native eucalypts. Yet this is where we first met, both of us on route to the Gibson Desert in search of the elusive *Eucalyptus rameliana*.

My friendship and collaboration with Ian began in 1990, when Ian was already recognised as the world leader in eucalypt taxonomy and employed at CSIRO in Canberra (and 56 years old at the time), and I was a 16-year-old school kid with a passion for knowing and growing eucalypts. I had read with curiosity about *E. rameliana* in Stan Kelly's Eucalypts books – a species known only from the type specimen collected in the remote heart of Western Australia by explorer Ernest Giles in 1876, and not collected again since. With my family's support, it became an ambition to rediscover the species. The single specimen of the species (the holotype) was held in the National Herbarium of Victoria. Upon making contact with the herbarium, I was told that the specimen was on loan to Ian Brooker in Canberra. Of course, I had known of the name Brooker prior to this, as I had a copy of Brooker & Kleinig's *Field Guide to Eucalypts* (only Volumes 1 and 2 had been published at the time), and as my dream was to someday grow every species of eucalypt, the name Brooker was a Supreme Being to me. So it was Ian's possession of the *E. rameliana* specimen that resulted in me making contact with him, and what followed was a life-long friendship based on our shared interest in eucalypt systematics and taxonomy.

Around this time, Ian and David Kleinig were researching and undertaking fieldwork for their third and final volume of their F*ield Guide to Eucalypts (northern Australia)*. Ian and David took up my invitation to join my family's second expedition to the Gibson Desert to look for *E. rameliana*, as it fitted in with one of their northern fieldtrips. And so it was that we all met for the first time at a hotel in Coober Pedy, and headed north-west from there.

Ian as my mentor

It was these first encounters with Ian in the field where I learnt much of the basics of plant collecting. Ian knew I had a lot to learn when, prior to us meeting in the field, I posted him some bloodwood twigs jammed into a plastic jar for identification. Ian was one of the most extensive collectors of eucalypt specimens, having lodged over 12,000 to various Australian herbaria, but more importantly, the quality of his specimens was always paramount, with emphasis on sample collection, sample pruning before pressing, the inclusion of field data on the specimen label (leaf gloss, bark type etc.) and the exclusion of redundant data on the specimen label (leaf size and shape etc.). Ian taught me the value of leaf oil glands and venation patterns and seedling morphology as diagnostic characters, amongst much else.

Throughout my later teenage and early university years, I would ring Ian at least weekly, when we would discuss all things eucalypt-related. On several occasions I remember asking Ian 'how do you distinguish species X from species Y (two very similar species)?', and his response would be 'the spelling'. Most of the time he was only half joking, but at other times he wasn't joking at all …

Ian was instrumental in me obtaining collecting permits to collect 'declared rare flora' eucalypt species from Western Australia in 1992, to enable me to establish the eucalypt collection that has become Currency Creek Arboretum. Gaining permission to collect specimens and seeds of rare plants of any type can be difficult, especially for an unknown 'kid' as in my case. But Ian could see that the risk to species and the potential mistakes I would make along the way would be far outweighed by the benefits of nurturing an upcoming eucalyptologist, such that he would effectively use his name

and position as a guarantor to allow me to gain collecting permits as a very young and inexperienced botanist.

Our collaborations

Ian and I undertook a number of field trips together, including to the remote Gibson Desert in central WA and the Everard Ranges in northern SA, in southern WA, parts of eastern NSW, south-eastern SA, and on Kangaroo Island in SA. We would often catch up in Adelaide when Ian came to visit (Ian was an Adelaide boy, and a keen supporter of the Adelaide Crows) and do short field trips locally or to the Currency Creek Arboretum.

Despite our friendship, Ian and I maintained our professionalism throughout our relationship, and our friendship and collaborations did not impact on our respective scientific methods. There were certain species that Ian had named that I did not recognise as distinct, and like many other botanists, I accepted the *Corymbia* split from *Eucalyptus*, while Ian did not. This never prevented robust discussion and collaboration, nor affected our friendship. Indeed, we co-authored five articles and jointly named ten taxa, with our collaboration culminating in our 2013 work *Atlas of Leaf Venation and Oil Glands in the Eucalypts*.

Fig. Sixteen-year old Dean Nicolle with Ian Brooker, sampling *E. sparsa (northern ranges box)* in central Australia in 1991. Ph. D. Nicolle.

Ian's legacy

Ian's contribution to eucalypt taxonomy and systematics is beyond peer during his time. He published more than 100 scientific articles, described over 200 new taxa, and made this group of plants more accessible to the general public through his contributions to books such as *Forest Trees of Australia*, the *Euclid* Lucid key, and his field guides. He is honoured in *Eucalyptus brookeriana* (Brooker's gum), named by Alan Gray in 1979.

Although Ian is most widely known for his *Field Guide to Eucalypts*, he is perhaps most infamously known for his 'New Classification of the Genus *Eucalyptus*', published in 2000, in which Ian sank the controversial genus *Corymbia* and the long withstanding genus *Angophora* into *Eucalyptus*. Unlike Ian, from the time *Corymbia* was described in 1995 until Ian's sad passing in June 2016, I accepted the three-genus system for the eucalypts, rather than Ian's single-genus classification. Most recently however, I am tending to side

with Ian on recognising the eucalypts as one genus, in opposition to the continued splitting of genera (in Myrtaceae and elsewhere) into more and more numerically smaller genera that are more difficult to field-identify. This was highlighted on my most recent field trip to WA, where it was noted that many myrtaceous genera cannot be easily distinguished in the field, even though their constituent species can be. It seems unfortunate in timing, or perhaps somewhat ironic, that Ian won't see me finally agreeing with his one-genus classification of the eucalypts.

Ian Brooker: types, new taxa and combinations, collections

Insights into the major contribution Ian Brooker made to plant systematics can be gained from on-line taxonomic and collections data sources; names data in the Australian Plant Names Index and Index Kewensis were accessed through the International Plant Names Index (Web ref 1), and collections (including type) data through Australia's Virtual Herbarium (Web ref. 2).

New taxa, statuses and combinations

Ian was sole or joint author of a considerable number of taxonomic novelties or name changes at the infrageneric, species and infraspecific level (Table 1). He was involved in newly describing and naming (*tax.nov.*) 176 species and subspecies and 126 infrageneric taxa. Of new taxa at the species level or below he was sole author of some 20% of these, at the

Table 1. Summary of Ian Brooker's taxonomic authorship of new taxa, names, combinations and status changes in *Eucalptus*. Data modified IPNI (Web ref. 1) with duplicate entries removed.

Rank	Taxonomic change	Sole author "Brooker"	Joint author-ship	Total
subgenus	*comb.nov.*	4	-	4
	nom.nov.	5	-	5
	tax.nov.	2	-	2
section	*comb.nov.*	4	-	4
	nom.nov.	13	-	13
	tax.nov.	15	-	15
subsection	*comb.nov.*	1	-	1
	nom.nov.	1	-	1
	tax.nov.	11	-	11
series	*comb.nov.*	9	-	9
	nom.nov.	2	-	2
	tax.nov.	30	20	50
subseries	*comb.nov.*	6	-	6
	nom.nov.	-	-	-
	tax.nov.	43	5	48
Infrageneric subtotal		146	25	171
species	*comb.nov.*	26	4	30
	nom.nov.	4	2	6
	tax.nov.	28	95	123
subspecies	*comb.nov.*	3	1	4
	stat.nov.	-	1	1
	nom.nov.	-	-	-
	tax.nov.	2	51	53
Species/infraspecific subtotal		**63**	**154**	**217**
Total		**209**	**179**	**399**

infrageneric level about 70%.

Collections

Ian Brooker's collections appear to have been confined to Australia and took him to all parts of the continent (Fig. 1). Ian was the principal collector of nearly 12,500 collections housed today in the Australian National Herbarium. He also was a co-collector of many collections where others were main collector. Over 94% of collections he had a hand in were Myrtaceous, largely eucalypts. Of the 60 holotypes of which he was a collector, all but one, that of *Daviesa purpurascens* Crisp, were eucalypts, and in all but one case he was the main collector of the specimen (from the charts output from Web ref. 2)

Other activities

Alex George (Fig. 2) and Dean Nicolle (prior article) remind us that Ian sampled other plant material.

Web references

1. *www.ipni.org/ipni/plantnamesearchpage.do* [search on "Brooker" in Standard author form field]
2. http://avh.ala.org.au/search#tab_advanceSearch [search on "Brooker" in Collector field and filter as appropriate]

Bill Barker

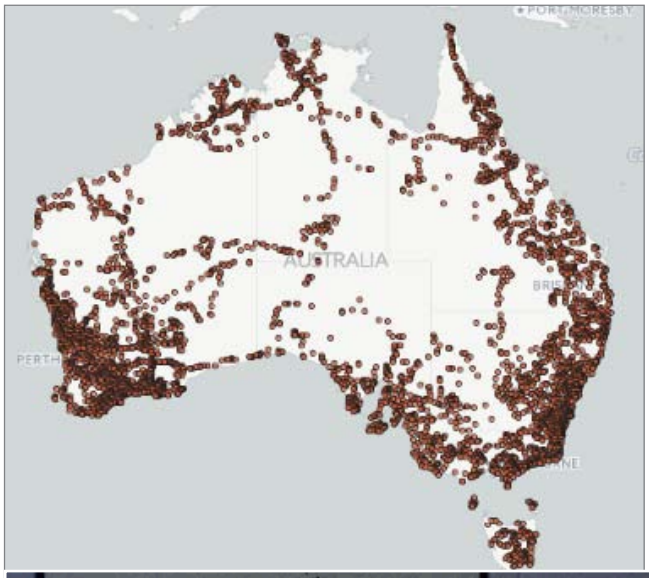


Fig. 1. Locations of Ian Brooker's 12,494 specimens made by him as principal collector; 94% are Myrtaceae, of which 90% are *Eucalyptus*, 9% *Corymbia* and 0.3% *Angophora*. In assessing the extent of his collections, the principal duplicate was assumed to be housed in the Australian National Herbarium (CANB). Source: Australia's Virtual Herbarium

Fig. 2. Another passion: Ian loved his reds and would go to great lengths to quench his thirst for them, as here at Tuttanning Reserve in 1969. Ph. Alex George.

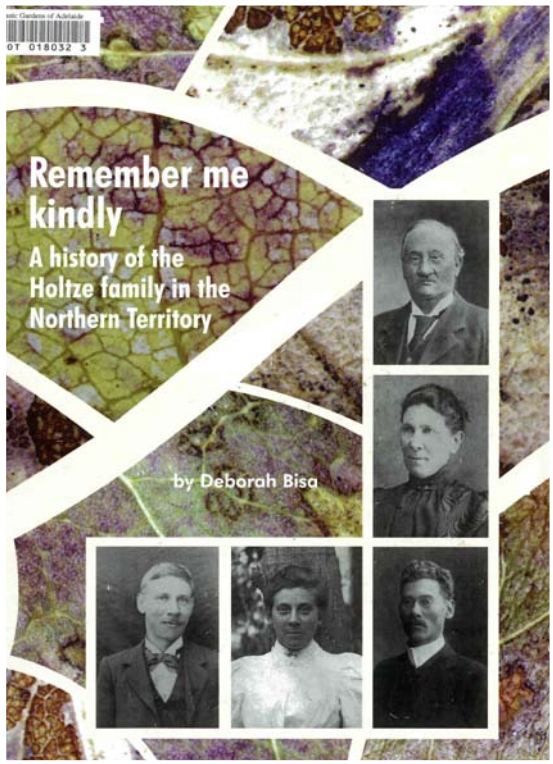
Book reviews

From little things big things grow

Review by: Philip Short
Driver, Northern Territory

[1]Remember me kindly. A history of the Holtze family in the Northern Territory. By Deborah Bisa (2016). (Historical Society of the Northern Territory Inc: Casuarina, NT 0811). Uniprint NT, Charles Darwin University
ISBN 1925167534, 9781925167535
***For orders see:* www.historicalsocietynt.org.au/downloads/HSNT-Booklist.pdf [2]**

On Saturday 13th August 2016, I attended a book launch in what I will simply refer to here as the Darwin Botanic Gardens (DBG), or even just Darwin gardens. It was a rather warm day, but not too sticky, the event was very well attended, and drinks and tasty nibbles were supplied by the Friends of the Botanic Gardens. I dutifully listened to various speakers, all of whom presented well. However, at one stage my attention was particularly drawn to an Aboriginal gentleman whose name seemed familiar. I couldn't quite place it at the time but, on reading this book, I found he was born under a coolibah tree near Birdum in 1942, was delivered by his grandmother, and had his umbilical cord cut with a butcher's knife by his grandfather! In 1976 he was made a Member of the Order of the British Empire (MBE) for Services to Sport. In the context of this review, he is a descendant of Maurice and Evlampia Holtze, who fled Russia in 1872 and arrived with their four children (Nicholas, Waldemar, Ludmilla and the baby Constantine) and ultimately settled in the fledgling township of Palmerston (as Darwin was then known, the Harbour being Port Darwin) the following year. And so, started the saga of the Holtze family in the NT, which at that time, was governed as part of South Australia.



I suspect I first became aware of the Holtze family in 1996 when broadly familiarizing myself with the history of botanical collecting in the Top End, and during which time I delved into a smallish book (106 pp.), *The Holtze Saga*, by Mrs Wynnis J. Ruediger, granddaughter of Maurice and Evlampia. It contained much general information about Maurice Holtze and his role as curator of the Darwin Botanic Gardens from 1871 to 1891, his subsequent directorship of the Adelaide Botanic Gardens, newspaper extracts about him and other members of the family, some family trees, as well as an opening account of Maurice and Evlampia's early years in Russia (Maurice was German, his wife Russian), the journey to Australia, and the ups-and-downs encountered in Port Darwin, with much of the detail as told to Mrs Ruediger by her grandmother. Thus, it is a book which wasn't written for the botanical historian, or at

[1] The title of a song by Paul Kelly & Kev Carmody concerning the Wave Hill walk off in 1966 and the struggle for equality and land rights of the Gurindji people.

[2] The first printing of this book sold out within 8 weeks! *Eds.*

least someone interested in learning about the herbarium specimens subsequently collected by Maurice, Nicholas and Waldemar. Indeed, the thing I've tended to remember from it are the tragedies, including the loss of Constantine. En route to Australia their vessel ran into a hurricane, during which time a wave broke their cabin's porthole and

> Little Constantine was washed out of his mother's arms and whirled around in the water" and was left "cold and badly frightened and … fretful for days.

About three months after their arrival in Palmerston "the harsh environment and vigours of the journey to Australia proved too much for Constantine." The following year, newly born Leopold died under particularly heart-wrenching circumstances. Again, I quote from Mrs Ruediger's book:

> " … his mother [Evlampia] became very ill with Low Fever and lost all her milk. There being no substitutes or baby food available, the poor infant virtually starved to death, for he would claw and scratch any food given to him, out of his mouth. Ludmilla would hide under the house in order to escape from his continual piteous crying, which gradually grew feebler as he grew weaker. One can well imagine the mother's state of mind."

... which is far from cheerful, but a reminder of how challenging a remote outpost could (and can) be.

In the same way that traditional taxonomic revisions have paved the way for subsequent molecular phylogenetic studies, *The Holtze Saga* was to be built upon by Deborah Bisa. Unlike Mrs Ruediger, who commented in relation to her book that

> Not all descendants have co-operated, some have preferred to be omitted, some do not want their photographs included and some we have not been able to trace,

Deborah has had access to a wide range of published material, letters, manuscripts and illustrations (including material from the National Archives of Australia and the Northern Territory Archival Services) and was to meet with a number of Maurice and Evlampia's descendants. All of which means that *Remember me Kindly* is a large work of 421 pages. It is also nicely presented and contains 284 illustrations, the latter a good mix of such things as early maps, letters, manuscripts, photographs of garden beds, herbarium specimens, herbarium labels, flower paintings, views of early Darwin, and (in keeping with a family history) photographs of Maurice and Evlampia, their descendants and colleagues.

As the full title indicates, *Remember Me Kindly* is a history of the Holtze family in the Northern Territory and when the project commenced in 2011 the focus was very much on the Holtzes and their association with the Darwin gardens, and centred largely on Maurice and Nicholas (who succeeded Maurice as the director). Indeed, apart from several early chapters concerning the backgrounds of Maurice and Evlampia, their move to foreign shores, and important background information regarding the early establishment of Palmerston, Chapters 7 to 15 are predominantly about these two men and their broad botanical exploits. There's much to glean about the establishment, management and use of the gardens, including Chapter 12 (pp. 103–157) which covers the early trialling of crops such as rice and sugar in the Top End, and concludes with a section titled "Problem Plant Introductions", which concerns the introduction of species such as *Mimosa pigra* and *Hyptis suaveolens*, a subject on which Maurice had published in 1892 (Holtze 1892). Chapter 15, of 13 pp., mostly concerns the collection of herbarium specimens for Ferdinand Mueller in MEL by Maurice, Nicholas and Waldemar. Chapter 16 deals with the life of Ludmilla Holtze.

In 2013 I cast an eye over what I believed then to be a manuscript nearing completion, and one which in content was not too dissimilar to what I've outlined so far. As it stood, for a book which I believed was to be centred around the Holtze family and the development of the gardens and the wider botanical interests of the family, it was clearly close to completion and would undoubtedly be welcomed by anyone with interests in the topic. It would be something akin to Pauline Payne's *The Diplomatic Gardener. Richard Schomburgk: explorer and botanic garden director*, the garden of which Schomburgk was director being Adelaide Botanic Garden. Indeed, at the time I believe I intimated that, in terms of content, no more needed to be done! However,

it didn't stop there as, about that same time, Deborah was contacted by a family descendant and put in touch with descendants of Waldemar Holtze. His story was not told in *The Holtze Saga*, and Deborah believed, quite rightly, that it should be. As she tells it in the introduction:

> Waldemar 'Wallaby' Holtze led an unusual life as an employee on the Overland Telegraph Line while based at several locations between Port Darwin and Tennant Creek. He holds a remarkable place as one of the longest-serving public servants with the Territory's early postal and telegraph services, an association which surpassed 60 years. The adverse conditions and the isolation Waldemar endured while based in some of the most remote and challenging outposts was a staunch pioneering feat. As a result of his employment, Waldemar developed strong connections to the land and its Indigenous custodians some of whom became his family. Holtze mixed-race descendants would invariably become members of the Stolen Generations. Some of their stories are presented in detail, especially the challenges faced by Waldemar's sons … and their families.

Wallaby's story added an additional 104 pages (including family trees and many photographs of descendants) to this publication, and having attended the book launch I can tell you that it has been well-received by the Holtze descendants.

Remember Me Kindly contains 10 appendices, all worthy of inclusion. For taxonomists, I note that Appendix G, contrary to what the title "Typification of species collected by Maurice and Nicholas Holtze" may suggest, contains no new typifications. It is a list of species for which the Holtzes collected type specimens, with typifications as given in AVH for each name. (Unfortunately, references to the taxonomists who made the typifications and the places of publication have been omitted.) The book is also thoroughly referenced and indexed.

This is an excellent book of which Deb should be proud. I thoroughly recommend it to anyone interested in Australian botanical gardens and their associated history, the experiences of pioneering families, and the treatment of aboriginal Australians.

As for the man who won the MBE, it was Bill Dempsey, an outstanding Australian Rules footballer who played in Darwin, the Western Australia Football League, and represented Western Australia from 1963–1973. In September this year he was named as a member of the AFLNT Northern Territory Team of the Century.

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Holtze, M. (1892). Introduced plants in the Northern Territory. *Transactions and Proceedings and Report of the Royal Society of South Australia* 15: 1–4.

Ruediger, W.J. (1988). *The Holtze Saga*. (Privately published. Printed by Lutheran Publishing House, Adelaide).

New books

Detecting and responding to alien plant incursions

John R. Wilson, South African National Biodiversity Institute & Stellenbosch University, South Africa;
F. Dane Panetta, University of Melbourne, Australia & Cory Lindgren, Invasive Species Specialist, Manitoba, Canada
Cambridge University Press, October 2016
Hardback; ISBN: 9781107095601
List Price: AUD$195.00, presently at AUD$156.00
www.cambridge.org/9781107095601

Ecologists, land managers and policymakers continue to search for the most effective ways to manage biological invasions. An emerging lesson is that proactive management can limit negative impacts, reduce risks and save money. This book explores how to detect and respond to alien plant incursions, summarising the most current literature, providing practical recommendations and reviewing the conditions and processes necessary to achieve prevention, eradication and containment. Chapter topics include assessing invasiveness and the impact of alien plants, how to improve surveillance efforts, how to make timely management decisions,

and how legislation and strategic planning can support management. Each chapter includes text boxes written by international experts that discuss topical issues such as spatial predictive modelling, costing invasions, biosecurity, biofuels, and dealing with conflict species.[From the website].

Weeds of the South-east – an identification guide for Australia

By F.J. Richardson, R.G. Richardson and R.C.H. Shepherd
Third edition, published 2016 by R.G. and F.J. Richardson, soft heavy-duty gatefold cover, 576 pages
ISBN 9780980388541
Price $A79.95 plus $A13.50 postage within Australia [up to 3 kg], overseas postage please request a quote.
www.weedinfo.com.au/bk_weedsosea.html

A comprehensive identification guide for weeds in the south-east region of Australia. This third edition has been fully updated and reorganised to recognise recent taxonomic changes and includes additional species, many new photographs and the latest distribution information.

Other features include:,

- an illustrated glossary,
- a section using flower colour and shape as an aid to plant identification,
- species include weeds of agriculture, bushland, waterways, gardens, roadsides, wasteland and amenity areas, as well as new and emerging problem species,
- illustrated with more than 3000 photographs including spectacular close-up shots,
- key features are described with relevant measurements for easier identification,
- comparisons are made to similar species and easily confused natives ,
- situations where the species are likely to be found, and
- distribution by State using the latest herbarium records.

Written in easy-to-understand language and beautifully illustrated, this is a field guide for anyone interested in the identification of pest plants and the preservation of our native flora. An essential tool for community land and bush care organisations, local and state government weed officers and advisers, rangers, agronomists, agriculturists, survey and identification botanists, horticulturists, landscapers and gardeners.

Supported by the Council of Australasian Weed Societies, Weed Society of New South Wales, Weed Management Society of South Australia, Tasmanian Weed Society and Weed Society of Victoria. [From the web site]

Robyn Barker

ASBS 2017 conference

Integrating Systematics for Conservation and Ecology
a September meeting for ASBS in Adelaide

Announced at the recent 2016 meeting of ASBS in Alice Springs, the next annual gathering of members will be held on 26–29 November, 2017 at The University of Adelaide.

The meeting is a joint meeting serves three groups. It is the annual conference of ASBS the biennial of the Society of Systematic Biologists (SASB) , and the biennial meeting of the Invertebrate Biodiversity and Conservation.

ASBS members on the organising committee are Michelle Waycott, continuing on from the Alice Springs experience, and Yelarney Beer, Jürgen Kellermann and Molly Whalen.

Ainsley Calladine will again organise the website. He reports:

> The website is very incomplete but this is where the information will be (although the registrations process will be handled by a commercial outfit the links will be from this site). I will have a news/announcement feed as I did for Alice Springs (I will likely send an announcement out on the 2016 list once the new site is mature)

Web site: *https://systematics.ourplants.org/*

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ASBS publications

Australasian Systematic Botany Society Newsletter
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Back issues of the Newsletter are available from Number 27 (May 1981) onwards, excluding Numbers 29, 31, 60, 84–86, 89–91, 99, 100, 103, 137–139, and 144. Here is the chance to complete your set.

Australian Systematic Botany Society Newsletter No. 53
Systematic Status of Large Flowering Plant Genera
Edited by Helen Hewson, 1987

This Newsletter issue includes the reports from the February 1986 Boden Conference on the "Systematic Status of Large Flowering Plant Genera". The reports cover: the genus concept; the role of cladistics in generic delimitation; geographic range and the genus concepts; the value of chemical characters, pollination syndromes, and breeding systems as generic determinants; and generic concepts in the Asteraceae, Chenopodiaceae, Epacridaceae, *Cassia*, *Acacia* and *Eucalyptus*.

Cost: Free for all newsletters except Number 53 (postage may be charged)
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Evolution of the Flora and Fauna of Arid Australia (book)
Edited by W.R. Barker & P.J.M. Greenslade.
Peacock Publications, ASBS & ANZAAS, 1982

This collection of more than 40 papers will interest all people concerned with Australia's dry inland, or the evolutionary history of its flora and fauna. It is of value to those studying both arid lands and evolution in general. Six sections cover: ecological and historical background; ecological and reproductive adaptations in plants; vertebrate animals; invertebrate animals; individual plant groups; and concluding remarks.

Cost: $20, plus $10 postage (in Australia).
This book is almost out of print. There are a few remaining copies.

To order a copy of this book email Bill Barker at: bill.barker@sa.gov.au

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History of Systematic Botany in Australasia (book)
Edited by P.S. Short. A4, case bound, 326 pp. ASBS, 1990

For all those people interested in the 1988 ASBS symposium in Melbourne, here are the proceedings. It is a well presented volume, containing 36 papers on: the botanical exploration of our region; the role of horticulturalists, collectors and artists in the early documentation of the flora; the renowned (Mueller, Cunningham), and those whose contribution is sometimes overlooked (Buchanan, Wilhelmi).

No longer available

AUSTRALASIAN SYSTEMATIC BOTANY SOCIETY INCORPORATED

The Society

The Australasian Systematic Botany Society is an incorporated association of over 300 people with professional or amateur interest in botany. The aim of the Society is to promote the study of plant systematics.

Membership

Membership is open to all those interested in plant systematics. Membership entitles the member to attend general meetings and chapter meetings, and to receive the Newsletter. Any person may apply for membership by filling in a "Membership Application" form, available on the Society website, and forwarding it, with the appropriate subscription, to the Treasurer. Subscriptions become due on 1 January each year.

The ASBS annual membership subscription is AU$45; full-time students $25. Payment may be by credit card or by cheques made out to Australasian Systematic Botany Society Inc., and remitted to the Assistant Treasurer. All changes of address should be sent directly to the Assistant Treasurer as well.

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The Newsletter is sent quarterly to members and appears simultaneously on the ASBS Website. It keeps members informed of Society events and news, and provides a vehicle for debate and discussion. In addition, original articles, notes and letters (not exceeding ten published pages in length) will be considered. Citation: abbreviate as *Australas. Syst. Bot. Soc. Newslett.*

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Send copy to the Editor preferably by email attachement submitted as: (1) an MS-DOS file in the form of a text file (.txt extension), (2) an MS-Word.doc file, (3) a Rich-text-format or .rtf file in an email message or attachment or on an MS-DOS disk or CD-ROM. Non-preferred media such as handwritten or typescripts by letter or fax are acceptable, but may cause delay in publication in view of the extra workload involved.

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The deadline for contributions is the last day of February, May, August and November. All items incorporated in the Newsletter will be duly acknowledged. Authors alone are responsible for the views expressed, and statements made by the authors do not necessarily represent the views of the Australasian Systematic Botany Society Inc.

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A 20% discount applies for second and subsequent entries of the same advertisement. Advertisements from ASBS members are usually exempt from fees but not the insertion costs in the case of a flyer. Contact the Newsletter Editors for further information.

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